RAILROAD GAZETTE

FRIDAY, JANUARY 25, 1895.

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## Contributions.

### Wheels on Land, Boats on Water.

RAHWAY, N. J., Jan. 16, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In his letter to you dated January 3, J. W. Lattig criticises the position that we have taken with reference to night signal practice. He argues that because we agree that the semaphore is the best day signal, it is obvious that a position signal is also the best by night. He says: "I fail to understand the logic of a line of argument which extols the semaphore for day service, and condemns position for night service."

The proper understanding of that point is the key to the situation. There may be some people who wonder why we travel on wheels overland, and on boats, over the ocean. The reason is that the two conditions are very different. What conditions could vary more as regards sight than night and day? The fact is that these conditions are so diametrically opposite, that after long experience the railroad community has adopted position and form for one condition, and a concentrated strong light for the other.

ARTHUR H. JOHNSON.

### American Society of Civil Engineers.

Last week, page 37, we gave a brief report of the more important facts of the business meeting of the American Society of Civil Engineers at its Annual Meeting.

Probably the most important of the reports presented was that of the Committee on Amendments to the Constitution. The committee consisted of Messrs. Whinery, Herschel, Bernard Green, Bixby, John Thomson, Metcalf and Strobel. Mr. Strobel presented a minority report. The report of the majority strikes us as being a particularly sensible and clear document. The first amendment proposed is Section 3, Article III., providing for the use of the word "references" in the case of corporate members, and "endorsers" in the case of associate, junior or fellow.

An amendment to Section 5 of the same article provides, that in the case of a reconsideration of an adverse vote against a candidate for membership each ballot sent in shall be signed by the member who votes it. This was considerably discussed, nearly all of the discussion, however, going to sustain the committee.

The most important amendment is that with regard to the method of making nominations, and this, together with the committee's arguments for it we print nearly in full below. The meeting voted to pass all of these amendments to letter ballot.

ARTICLE VII.

Strike out the whole of the present article and substitute the following:

"Section 1. The Board of Direction shall, from time to time, divide the territory occupied by the membership into seven geographical districts, to be designated by numbers. District No. 1 shall be the territory within 50 miles of the Post Office in the City of New York. Each of the other six districts shall be, as nearly as practicable, contiguous territory; each shall contain, as nearly as practicable, an equal number of members, and they shall be designated as Districts No. 2, 3, 4, 5, 6 and 7. The Board shall announce such division to the Society on or before the first day of May in each year.

"Sec. 2. At the Business Meeting of the Annual Convention of each year, seven Corporate Members, not officers of the Society, one from each of the geographical districts, shall be appointed by the meeting to serve for two years; who, with the five living last Past Presidents of the Society, shall be a committee to nominate officers for the Society. The Board of Direction may prescribe the mode of procedure for appointing this committee. This committee shall present to the Board of Direction, on or before the first day of October next ensuing, a list of nominees for the offices to be filled at the next Annual Election. The nominees shall be so chosen as to provide, with the officers holding over, a Vice-President and six Directors residing in District No. 1, and 12 Directors divided equally, with regard to number and residence, among the remaining districts, Nos. 2, 3, 4, 5, 6 and 7.

"Sec. 3. Directly after the first of October the aforesaid list of nominees shall be mailed to every Corporate Member whose address is known, provided that if any person shall be found by the Board of Direction to be ineligible for the office for which he is nominated, or should a nominee decline such nomination, his name shall not be sent out, but the Board shall substitute another name therefor. The Board shall also fill any vacancies that may occur in this list of nominees up to the time the ballots are sent out. Vacancies must be so filled as to preserve the geographical distribution of officers prescribed in Section 2 of this article.

"Sec. 4. At any time before the first day of December, any 10 or more Corporate Members may send to the Secretary additional nominations, signed by such members; but nominations so made must comply with Section 2 of this article, regarding the distribution of nominees among the several districts.

"5. At least 30 days before the Annual Meeting, there shall be mailed to every Corporate Member whose address is known a letter-ballot with envelopes for voting. This ballot shall include all the nominations made in accordance with this article. The names and residences of the nominees, their grades of membership, and, in the case of nominees for Directors, the number of the district in which they reside, shall be given. The names of the nominees for any one office shall be arranged alphabetically without distinguishing marks of any kind other than the designations named herein.

"Voters may erase names from the printed ballot list and may substitute the name or names of any other person or persons eligible for any office. But the number of names for each office on the ballot voted must not exceed the number to be elected at that time to such office, and the vote must be for the proper number of officers resident in each of the seven districts. Ballots not complying with these provisions shall be rejected.

"Directions in accordance with these provisions shall be issued with the ballots.

"6 Ballots may be sent by mail to the Secretary, or may be presented to him at the Society House. They must be enclosed in two sealed envelopes, and the outer envelope shall be endorsed by the voter's signature.

"The Secretary shall make from the signatures on the outer envelopes a list of the voters from whom ballots are received, which list shall be open to inspection by all Corporate Members. A voter may withdraw his ballot, and may substitute another, at any time before the polls close.

"7. The polls shall be closed at 12 o'clock, noon, on the first day of the Annual Meeting, and the ballots shall be canvassed publicly by tellers, who shall be appointed by the presiding officer.

"The persons of each district, who shall receive the highest number of votes for the office for which they are candidates shall be declared elected.

"In case of a tie between two or more candidates for the same office, the Annual Meeting shall elect the officer from among the candidates so tied.

"The presiding officer shall announce to the meeting the names of the officers elected, in accordance with this section."

It is proper that the Committee should refer to these amendments in detail, and state briefly the reasons for its action.

Art. III., Sec. 5 The only important change recommended to this section is the requirement that ballots on reconsideration of rejected applications for membership, must be signed by voters.

The fact that worthy engineers have been kept out of the Society by the votes of a few members actuated by personal and unworthy considerations is known and deeply regretted by all who have the welfare of the Society at heart. While it is of the greatest importance that every proper precaution against the admission of unworthy persons should be provided in the Constitution, and while as a means to this end the secret ballot has much to recommend it, the fact is clear that it may be, and in not a few cases has, been abused, to the detriment and discredit of the Society..

There has never been a time in the history of the Society when the character and standing, both personal and professional, of applicants is so carefully and rigidly investigated by the Board of Direction as now, and there is good reason to believe that there will be no relaxation in this regard in the future. Every member of every grade is offered ample opportunity, through the Blue-List notices, to make known to the Board of Direction any facts or reasons he may be in possession of affecting the character and professional standing of every applicant.

If the applicant is rejected upon the first ballot, and a request for a reconsideration is made, every member is again notified and asked to communicate to the Board and facts or reasons for or against the applicant. Every member is thus given another opportunity to be heard upon every application for reconsideration, and the Board has never failed to reject an application where satisfactory evidence has been offered that the applicant is unworthy.

It seems to the Committee that in the case of the second ballot, after the Board has, in the light of all the facts obtainable, twice investigated the character and professional standing of an applicant and decided that there is no substantial reason for rejection, it is desirable that the secret ballot should be dispensed with. The Society cannot afford to be placed in the light of providing, through a secret ballot, the protection from behind which members actuated by unworthy motives may pursue the method of warfare commonly known as "bushwhacking," and condemned by all civilized people.

There will, of course, be honest differences of opinion as to whether an applicant is entitled to membership in the Society, and the right to vote against admission should not be abridged; but it is believed that members who are actuated by proper and worthy motives will not object, when voting on this second ballot, to placing themselves on record by signing their ballot.

ARTICLE VII.

The Committee has regarded the subject of the nomination of officers for the Society as the most important matter referred to it, and has given to it the most careful consideration.

The first question considered was whether, under Resolution 5, adopted at the Annual Convention in 1894, and quoted above, the Committee should restrict its action to the plan of making nominations referred to therein. Inasmuch as the member who offered this resolution stated to the meeting before the vote on it was taken that it was not intended to restrict the action of the Committee, but only to express the views of those present at that meeting, the Committee felt authorized to consider other plans for nominating officers, and to report to the Society that plan which, in view of all the conditions to be met, seemed likely to prove most satisfactory in use. Therefore, a number of plans proposed by members of the Society including the three brought to the attention of the Annual Convention of 1894, were carefully considered. The plan which the Committee recommends to the Society differs from that now in use in the following particulars:

First.—It makes the division of the territory occupied by the membership into seven geographical districts a constitutional provision, and divides the non-resident members of the Board of Direction equally among the six non-resident districts.

Second.—It increases the number of elective members of the Nominating Committee from seven to fourteen, and makes the term of service two years, seven members being elected each year.

Third.—It empowers the Board of Direction to prescribe the mode of procedure in the election of members of the Nominating Committee. The considerations that have influenced the Committee in its action on this subject may be briefly stated as follows:

1st. The most serious obstacle to the most satisfactory working of any plan for nominating officers is the fact that the members of the Society do not take an active interest in the matter. This is shown by the fact that letters sent out by the Secretary, or by nominating committees, asking for suggestions relating to nominations are answered by a very small percentage of the membership. This fact has largely influenced the Committee against any plan of making nominations dependent for its initiation or carrying out on replies by mail to circular letters; and while such circulars and replies are of value as auxiliaries, it would be unwise to limit the method of nominating officers to such a plan.

2d. The Committee believes that nominations for officers should be made by the direct representatives of the membership at large. This accords with the spirit of American institutions, and places the responsibility for the government of the Society directly in the hands of the membership.

3d. For the same reason, the Nominating Committee should be appointed at the Annual Convention, which is more representative in character than the annual or any other meeting of the Society.

The holding of the convention in a different locality each year, and the large number of members usually in attendance, brings them closely in touch with the government of the Society, and affords the only opportunity that many of them have of taking part personally in the management of the Society's affairs.

4th. The provision that each of the six non-resident districts shall be represented by two Directors resident in that district will, in addition to securing a satisfactory geographical distribution of the Board of Direction, tend, we believe, to greatly increase the interest of the membership in the nomination and election of officers of the Society. It will bring the matter nearer home to every member, and will enable him to assist in selecting at least two of the Directors from among those he probably knows best, either personally, or by reputation. This provision does not change the number of members of the Board, nor alter the number or status of Resident Directors.

5th. It is desirable that the Nominating Committee should be large enough so that its meetings will likely be attended by a considerable number of members, as its action is likely to be more representative and satisfactory than when only a few are in attendance and make the nominations. The amendments now offered provide for a committee of 14, appointed by the convention, and the five living Past Presidents of the Society, 19 in all.

6th. It is thought desirable that the members of the Nominating Committee should serve more than one year. As officers of the Society cannot serve on the Committee, it will often happen that a member appointed on this Committee will have had neither much experience in the affairs of the Society, nor a large acquaintance with its members, and he will feel at a loss to act intelligently. The experience he will gain in the first year's service will be of value, both to himself and to the Society, in making the nominations for the second year. At the same time, the term of service would be short enough to insure that the Nominating Committee will remain in close touch with the popular element in the Society. The Committee has designated two years as the term of service.

7th. It is hardly usual, nor would it be wise, in the opinion of the Committee, to prescribe in the Constitution full details for the appointment of the Nominating Committee. If, through change of conditions, or of opinion among the membership, it should become desirable to alter such details, it could only be done by amending the Constitution. It is, therefore, thought best to leave the details of the manner of procedure in electing the Nominating Committee to the Board of Direction.

The Committee on Units of Measurements reported progress and was continued.

The Committee on Uniform Methods of Testing Materials, etc., made a final report and was discharged. The report was signed by Messrs. Burr, Dagron, R. W. Hunt and Seaman. Mr. Percival Roberts, Jr., made a minority report. The Committee is of the opinion that standard specifications should be general to meet the requirements of usual conditions and to lead to more nearly uniform practice in shops and mills, at the same time leaving the engineer free to meet special needs. In the matter of cast iron a transverse test is recommended, being the loading of the specimen with 2,000 lbs. or more, the specimen being 27 inches long resting flatwise on supports 24 inches apart and being itself 2 in. x 1 in. In the case of wrought iron the Committee recommends that the expression "electric limit" be confined in use to its original meaning, and the committee confines itself to the expression "yield point" in practical testing. It recommends a minimum gaged length of 8 inches in general with not less than 12 inches between shoulders or between the jaws of the machine; but the gaged length shall in no case be less than four times the greatest diameter of the test piece and the minimum thickness shall be ¼ inch. The sectional area shall not be less than one-half a square inch. It is recommended that bending tests be continued and made rapid with pressure rather than blows; but the nicked bending or fracture test is not recommended.

The methods of testing wrought iron may in general be applied to rolled steel with a quenching test in addition. The drifting test is not recommended nor the annealing test except for full sized eye-bars. Certain requirements are laid down for ultimate strength, etc, both for wrought iron and steel; but as we do not know precisely how much of this matter we are at liberty to print we omit them. For steel castings a tension test is recommended with also certain requirements.

Mr. Roberts does not think it desirable to recommend any definite set of specifications; therefore he enters into no dicusssion of the recommendations of the rest of the committee.

A good deal of discussion resulted from the presentation of this report, the upshot of it being that it was received and the committee discharged and that nobody knows precisely what will be done with it. We should suppose, however, that arrangements will be made for the presentation of the report at one of the regular monthly meetings and for full opportunity for its discussion.

After the close of the afternoon meeting the new Board met for organization, and in the evening a jolly, handsome and well attended reception was given by the resident members at the Waldorf Hotel.

On Thursday an excursion was made to Willett's Point where the work of the Engineer School of Instruction was looked into, torpedoes were exploded, the great magnet was exhibited and altogether a number of interesting things were seen. The chief point of such an excursion, however, is the chance for talk, and in this respect it was doubtless a great success. In the evening the mem-

bers and their friends assembled to listen to an address by Mr. Charles E. Emery, on the "Utilization of the Forces of Nature," which was excellently illustrated by lantern slides.

## Locomotive Boiler Efficiency.

Between 1885 and 1890, M. A. Henry, one of the principal engineers of the Paris, Lyons & Mediterranean Railroad, examined carefully the action of fires in locomotive fireboxes. These experiments were published in the *Annales des Mines* and in the *Railroad Gazette* of July 4, 1890. In 1892 M. George Marié continued the work started by M. Henry and gave the results in the *Annales des Mines*. These results are now given in a separate publication entitled "Etude Expérimentale de la Vaporisation dans les Chaudières de Locomotives," published by Vve Ch. Dunod & P. Vicq, Paris.

It is impossible to give the full text of this long and valuable report, but we give a synopsis of the more important conclusions and a general account of the tests.

The boiler used in these experiments is shown in Fig. 1. The service steam pressure is 142 pounds per square inch. In the tests the pressure was held constant; the feed water was supplied by an injector. The shell was made up of rings, as will be seen from the illustration, in such a way that the tubes could be varied in length.

The illustration shows the boiler when the tubes are 23 ft. long. In addition to the tests with the plain firebox the brick arches and the Tenbrink water arch, shown in Figs. 2, 3, and 4, were tried. The Tenbrink device, shown by Fig. 4, has the dimensions that have been used by the Compagnie d'Orléans.

The following table gives the principal dimensions of the trial boiler:

| | | |
|---|---|---|
| Number of brass tubes | 185 | |
| Diameter of tubes outside | 1.96 | inches |
| " " inside | 1.81 | " |
| Area of tube openings without the reducing ferrules | 33.2 | sq. ft. |
| Area of tube openings with the ferrules | 20.4 | " " |
| Area of the grate | 25.2 | " " |

Exposed area of heating surface in the firebox:

| | | |
|---|---|---|
| With the long brick arch | 10.8 | " " |
| " " short " " | 10.9 | " " |
| " " Tenbrink " | 15.3 | " " |

Heating surface of the interior of the tubes:

| Length of tubes. | Interior area. |
|---|---|
| 23 feet | 2020 sq. ft. |
| 19.7 " | 1730 " " |
| 16.4 " | 1445 " " |
| 14.8 " | 1298 " " |
| 13.1 " | 1154 " " |
| 11.5 " | 1010 " " |
| 9.85 " | 864 " " |

The dimensions of the openings at *a* and *b*, Figs. 2, 3 and 4, are as follows:

| Figures | *a* | *b* |
|---|---|---|
| 2 | 3.8 sq. ft. | 5.1 sq. ft |
| 3 | 3.8 " | 6.2 " |
| 4 | 3.38 " | 4.55 " |

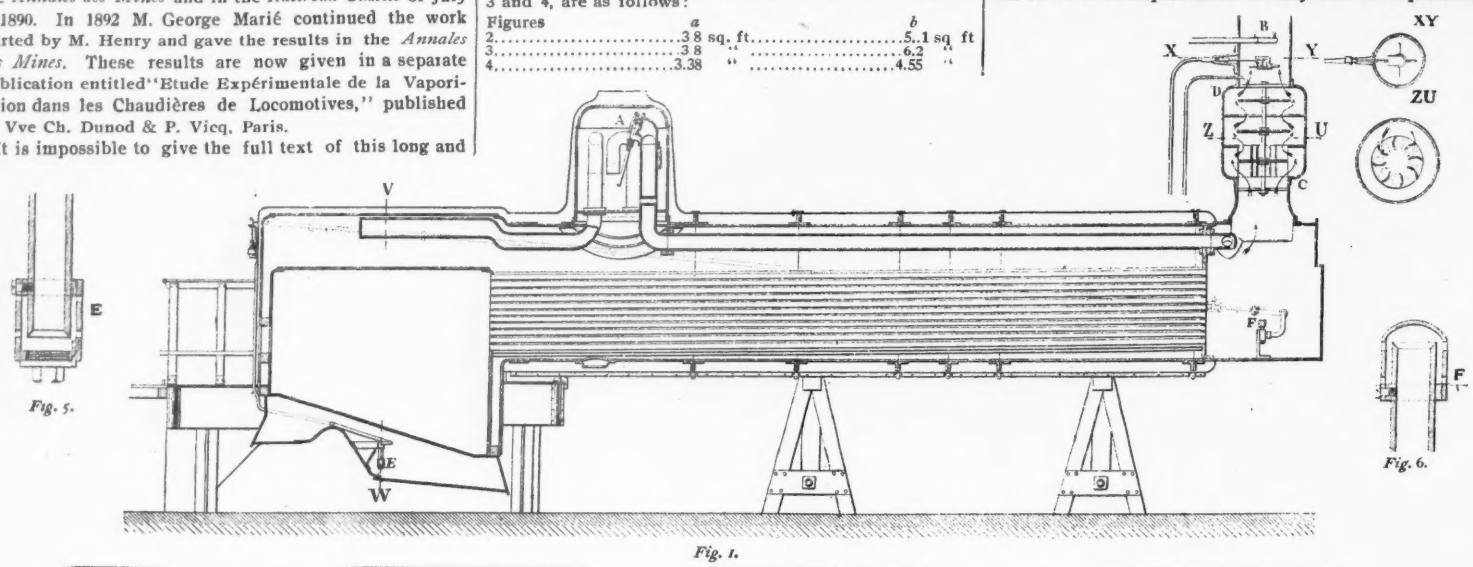



Fig. 5. Fig. 6. Fig. 1.

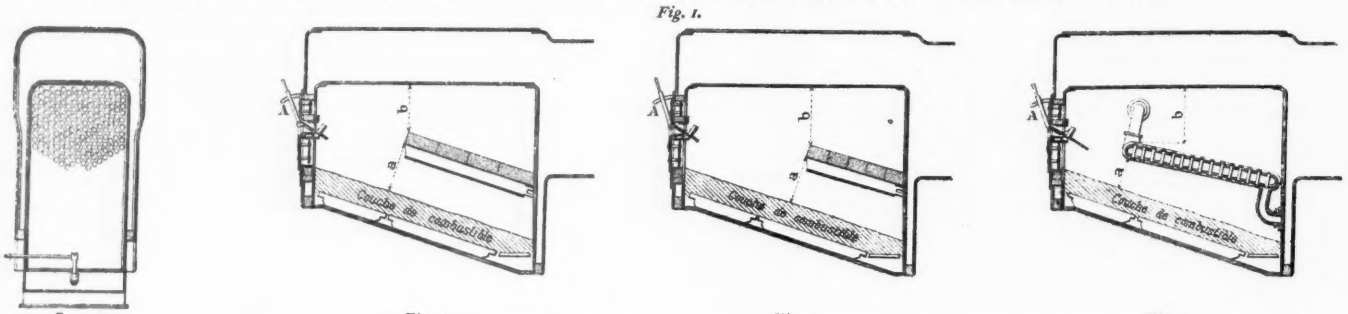



Fig. 1a. Fig. 2. Fig. 3. Fig. 4.

Figs. 1 to 6.—Construction of the Different Fireboxes; Ends of the Vacuum Tubes in Figs. 5 and 6.

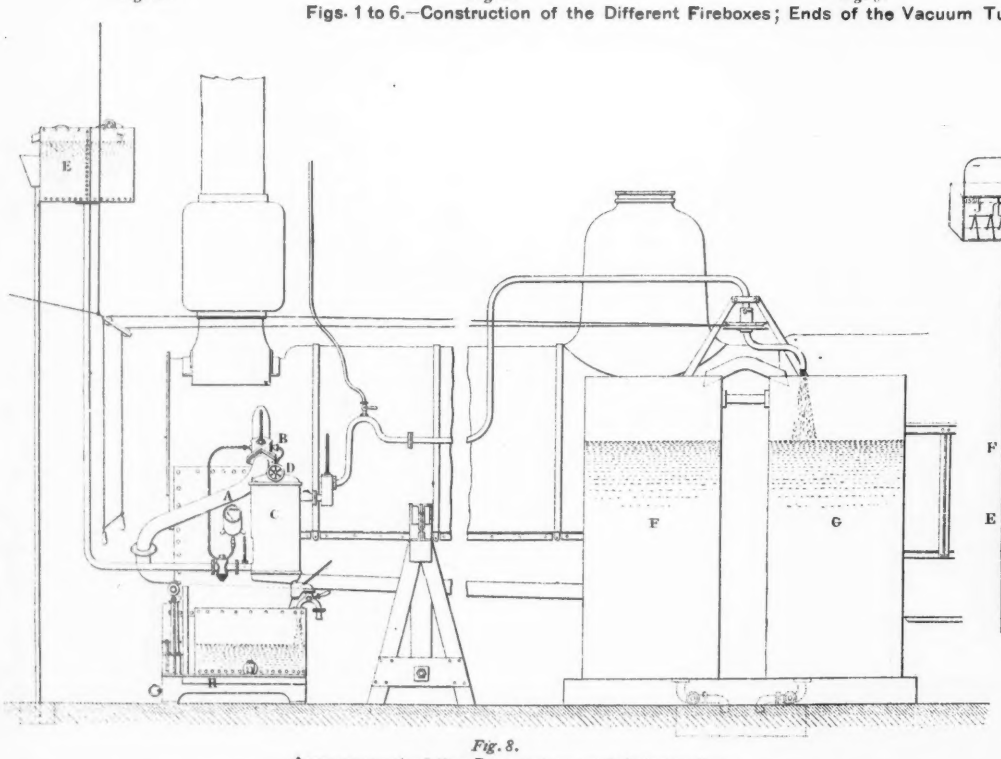



Fig. 8.

Arrangement of the Pyrometers and Calorimeters.

During the firing with these tests air was admitted above the fire through the fire door. The vacuum in the ash pan and in the smokebox were both measured by water manometers. The ends of the pipes leading to the instruments are shown in Figs. 5 and 6, and the locations of the pipes are shown in Figs. 1 and 1a.

The temperatures of the smokebox were measured by a mercurial thermometer when the tubes were long. With the shorter tubes, the smokebox temperatures being higher a Salleron pyrometer was used. As shown by Fig. 7, this consists of a small mass of metal *A*, that is heated by the gases and allowed to fall into a calorimeter *B*, containing a known amount of water at a given temperature. In this way data enough is collected to permit the calculation of the temperature of the mass of metal, and this is taken as the temperatures of the smokebox

An air thermometer was used for indicating the variations of the temperature. Its indications were not as reliable as the other devices, but it served well the useful purpose of showing the variations of temperature, and permitting the registration of those variations as the fires varied. The registering apparatus is not shown. This air thermometer also served to ring a bell to notify the fireman that the temperature of the smokebox was low, and that it was time to put on more coal. The construction of this air thermometer is shown by Fig. 7. There is a coil of pipe containing air at *C*, in the smokebox, one end of which is connected with a mercurial manometer with a float as shown. See Fig. 7 at *E*, *F*, *G*, *H*, *J*, *K*, *D* and *C*. The electrical connections are also shown.

To get the composition of the gases in the smokebox was found to be impracticable as they were so imperfectly

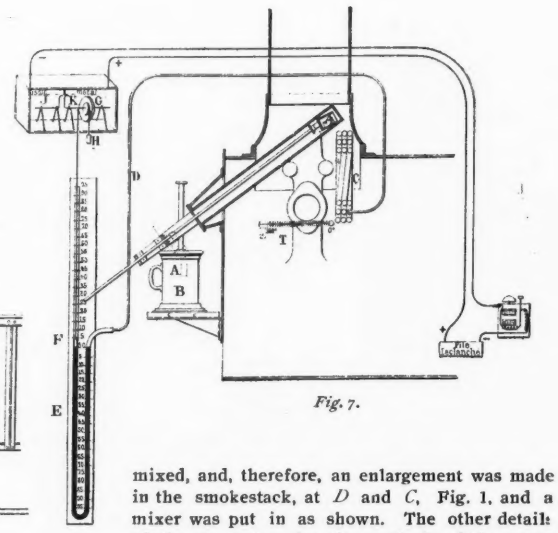



Fig. 7.

mixed, and, therefore, an enlargement was made in the smokestack, at *D* and *C*, Fig. 1, and a mixer was put in as shown. The other details of the apparatus for the analysis of the gases are given in the report, but are too long to be given here.

The dryness of the steam was measured by a condensing calorimeter, which is shown at *A*, *B*, *C* and *D*, Fig. 8. The ashes left in the firebox and the heating power of the fuel were determined. The records were taken with several lengths of tubes, with the different arches in the firebox and with a smokebox vacuum of 1.0, 1.77 and 2.95 inches of water. To get as nearly as possible a constant fuel a uniform briquette was chosen. The tubes and the boiler were kept as clean as possible during the tests.

Preliminary tests were made to learn the best thickness of the fire on the grates, and the best size of the fuel to use so as to get a uniform fire well suited to the experiments. A standard thickness of fire was adopted for each different condition, and during each test the fire was kept at a uniform thickness. It was found that the temperature of the smokebox dropped just after firing, and then rose to a maximum and then dropped again. This second drop was taken as time to fire again, and announced by the electric bell shown in the illustrations.

The tests were organized with such care that the results duplicated each other. It was found that the method of firing that was adopted was that which gave the best results in practice. The table shows the thickness of fire used with the different lengths of tubes.

| Length of Tubes. Feet. | Thickness of Fire with Different Blasts. Inches of Thickness. Vacuum, 1.0 in. | 1.77 ins. | 2.95 ins. |
|---|---|---|---|
| 23 | 5 7 | 8.4 | 11.7 |
| 19 7 | 5.9 | 8.7 | 11.9 |
| 16 4 | 6 5 | 9.1 | 12.4 |
| 14.8 | 7.1 | 9.5 | 13.0 |
| 13 1 | 7.9 | 10.3 | 13.7 |
| 11.5 | 8.9 | 11.4 | 14.6 |
| 9.9 | 10.0 | 12.6 | 15.8 |

Figs. 9, 10, 11 and 12 show the combustible burned per hour. Figs. 13, 14, 15 and 16 show the water evaporated per hour. Figs. 17, 18, 19 and 20 show the water evaporated per pound of fuel used. Figs. 21, 22, 23 and 24 show the temperature of the smokebox. The report also contains diagrams showing results with tubes having wings like the Serve tube.

Some of the conclusions of the report are as follows·

The rate of combustion is less with the arches in the firebox than without them. This is as true with the Tenbrink water arch as with the brick arches. The reduction is greatest with the long brick arch, and about the same with the short brick arch as with the Tenbrink.

The rate of combustion increases as the length of the tubes diminishes. The increase varies from 11 to 19 per cent. It is about 15 per cent. when the tubes are shortened from 16.4 to 9.85 feet. The increase of the rate is less when the blast is strong.

The rate of combustion increases rapidly as the blast is increased. A decrease of the vacuum from 1.77 to 1.0 inches decreased the rate from 25 to 31 per cent., according to the type of the firebox and the length of the tubes. The rate of combustion increased from 27 to 33 per cent. when the vacuum increased from 1.77 to 2.95 inches of water.

The long brick arch diminishes the steaming power always, but to a greater extent with the longer tubes. The short arch diminishes the rate for the long tubes, but increases it for the short tubes. The point where there is a change from an increase to a decrease is when the tubes are about 13.5 feet long.

The Tenbrink arch acts like the short brick arch, but the effect is greater. The point of change with this arch is when the tubes are 16.4 feet long. With tubes less than this in length, this arch increases the power of the boiler. With short tubes this arch increases the power of the boiler about 3 to 5 per cent. with a vacuum of 1.77 inches.

The power of the boiler increases as the tubes are shortened, and reaches a maximum when the tubes are between 13.1 and 14.8 feet long. Below these lengths the power of the boiler is less. This is explained by the fact that as the tubes are shortened the friction of the gases in the tubes is decreased with the result that the activity of the combustion is increased, and the power of the boiler is made greater. On the other hand, as the tubes are shortened, the heating surface is less, and this reduces the efficiency. The loss of efficiency is very great when the tubes are very short, and then it overcomes the gain due to the greater rate of combustion.

The vacuum affects the power of the boiler in the same way as it affects the rate of combustion.

The entrained water was found to be so little that it was not taken into account. It was scarcely measurable.

The long brick arch increases the efficiency more as the tubes are shortened and the vacuum is greater. The short brick arch has the same general effect, but to a less degree. The Tenbrink arch has the same effect as the long arch on the efficiency.

The efficiency decreases as the tubes are shortened, and for very short lengths the decrease is greater. This is shown by the diagrams.

The efficiency decreases as the vacuum increases, and this decrease grows greater as the tubes are more and more shortened. The influence of the vacuum on the efficiency is greater with the plain firebox than when the brick arch is used, and is greater with the short arch than with the long arch or Tenbrink.

The use of the brick arch or the Tenbrink always reduces the temperature of the smokebox. The effect of the long arch and the Tenbrink are about the same, and they decrease the temperature from 4 to 6 per cent. The short arch reduces it from 1 to 3 per cent.

The temperature of the smokebox increases as the tubes are shortened. When the tubes are shortened from 16.4 to 9.85 ft. the increase is from 40 to 50 per cent. This increase is greater when the vacuum is higher.

The temperature increases as the vacuum is made higher, and rises about 20 per cent. when the vacuum is increased from 1.0 to 2.95 inches; the greatest rise is with the shortest tubes.

For the same firebox, and for the same vacuum, the plugging of a number of the tubes does not change the efficiency of the boiler, but diminishes the power about in proportion to the reduction of the number of tubes. Some of the conclusions about boiler design are as follows:

The maximum power of the boiler being of the greatest importance, it should be sought for most.

It is best to have a large grate surface, and the short brick arch or the Tenbrink. These arches with tubes from 13.1 to 14.8 feet give more power and greater efficiency than the common plain firebox. The Tenbrink is a little better than the brick arch, but with large fireboxes the inconveniences balance the advantages.

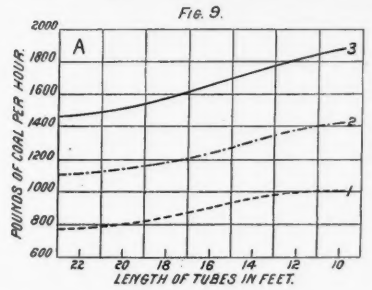
Tubes of a length from 13.1 to 14.8 feet are preferred as they give the maximum power with a reasonable economy. When greater weight is needed than is obtained with these lengths of tubes, it is better to get the increase in some other way than by lengthening the tubes. The length of the tubes should never be less than 13.1 feet if it can be avoided, and should not be made as short as 9.85, as with that length there is a loss of efficiency of 15 per cent.

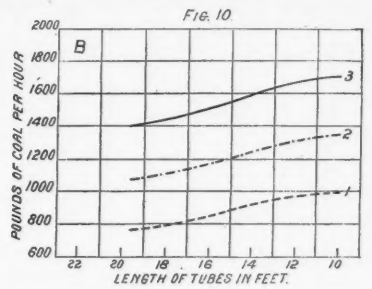
The influence of the vacuum is so great that one should use every effort to increase it, and to give to it as wide a variation as possible without increasing too much the back pressure in the cylinders.

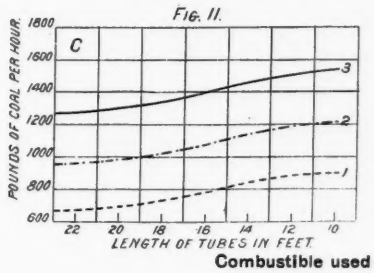
The number of the tubes should be increased as much as possible so as to gain in power and efficiency.

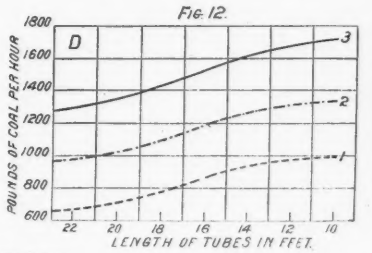
The accounts of these experiments contains the results of tests with tubes having interior wings, such as the Serve tube, but for the work done with locomotives in this country, tubes of that kind are hardly practicable, and the results are not given here.

Further remarks about these tests will be found in the editorial columns.

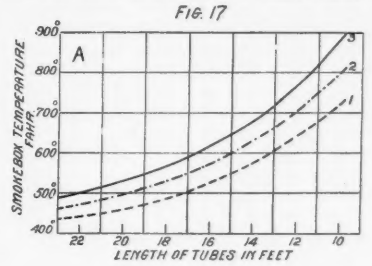


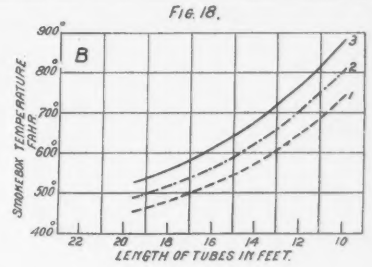



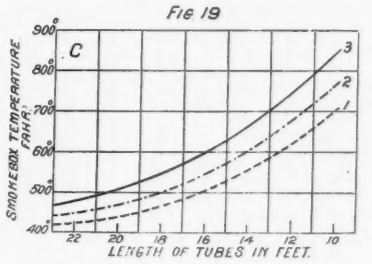



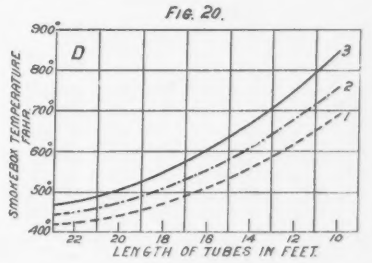




Combustible used per hour.

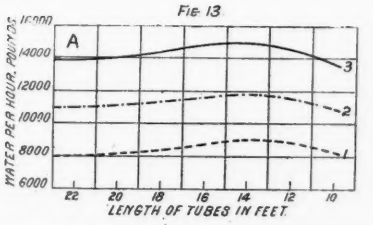


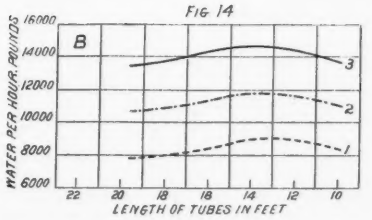



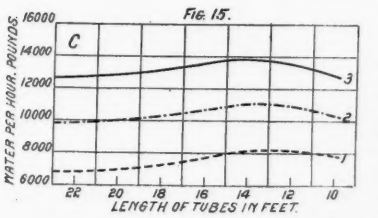



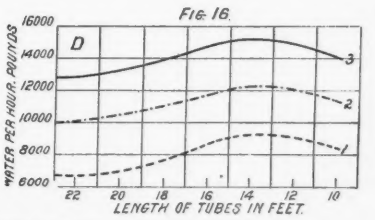




Water evaporated per pound of fuel used; the Efficiency.

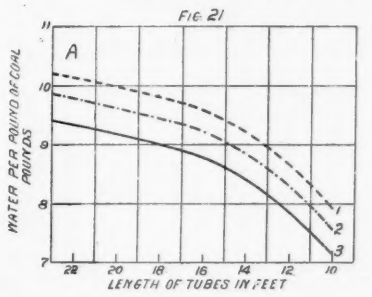


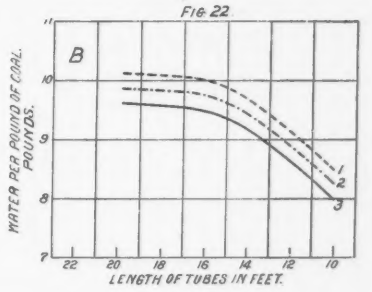



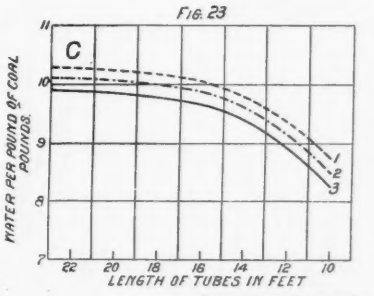



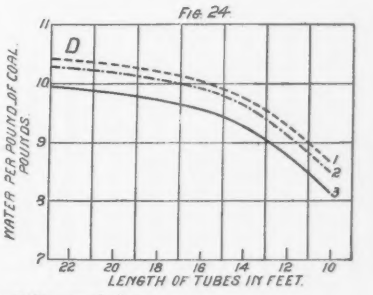




Water evaporated per hour.




Average temperature of the smokebox.

*Diagrams A, B, C and D are with the plain firebox, the short brick arch, the long brick arch and the Tenbrink water arch respectively.*
*Lines marked 1, 2 and 3 give the results with a vacuum of 1 inch, 1.77 inches and 2.95 inches respectively.*

## The International Railway Congress.

The date of the International Railway Congress is now fixed, and the outline of the arrangements is as follows:

The formal opening of the Congress will be at the Imperial Institute by the Prince of Wales on Wednesday, June 26th, at 3 p. m. On Thursday morning, parties will start for a three or four days' visit to points of railroad interest, chiefly in the center of England and in Lancashire; they will probably get back some time on Sunday. The whole of the next week, except Wednesday and Saturday afternoons, will be devoted to discussions. Wednesday afternoon there will be visits to points of railroad interest in London; Saturday afternoon there will be pleasure excursions—some of them perhaps lasting into Sunday. Monday, July 8th, and Tuesday, the 9th, will be also devoted to discussions, the closing session of the Congress taking place on the Tuesday evening. On Wednesday morning parties will start for Scotland, more especially the Forth Bridge, and perhaps for Ireland.

In addition to the fixed excursions delegates to the Congress will have free passes over all the English railroads, and will be at liberty to go independently if they

please. The different railroad companies will, as far as possible, arrange for guides to show them over shops, freight yards, passenger stations, etc., etc.

It is interesting to note that the last American "adherent" to the Congress is the Arizona & South Eastern. It is a great pity, also a business mistake that more of the big systems have not joined.

### A Pressed Steel Truck Bolster.

In the 1893 report of the Proceedings of the Master Car Builders' Association appears the results of some experiments to determine the strength under loads of truck bolsters of various kinds. These were reprinted in the *Railroad Gazette* of June 23 of that year, but we show them again in this issue, in order to show with them the results of tests of a steel bolster which has recently been brought out under the name of the Diamond pressed steel bolster. The loads, deflections and permanent sets of the various bolsters are shown with the engravings. With the Diamond bolster appear two sets of results, one set from tests made by the manufacturers, the Schoen Mfg. Co., the other from tests made by the R. W. Hunt Co.

It will be seen that of the bolsters tested by the Master Car Builders' Committee only two sustained a load of 25,000 lbs. without permanent set, but from an engineering standpoint a truck bolster should be capable of carrying about three times the load that it is rated to carry. The two bolsters which stood the tests without permanent set are combination bolsters; that is, wooden bolsters reenforced with iron plates. This, however, does not appear to be a theoretically satisfactory arrangement, for such a combination will be at its best only while it is new, and will begin to deteriorate from the time it is put in service. Its duty depends upon all the bolts remaining tight, but obviously the wood, however well seasoned, will begin at once to shrink, and the bolts will begin to get loose. This weakness will, of course, not appear in a bolster made entirely of metal. Perhaps the best answer that we can make to those who will suggest that the rivets will work loose is the testimony that we have received within a few days from a Superintendent of Motive Power with regard to pressed steel trucks, which he has used pretty extensively, and for some years. He says that in two years not a cent has been spent on those trucks.

The Diamond truck bolster shown in the engraving is made of steel channels deeper in the middle than at the ends. It can be made to save from 300 to 500 lbs. of weight per car, as compared with the combination bolster, and the manufacturers say that it can be furnished for little if anything above the cost of the trussed or composite bolster.

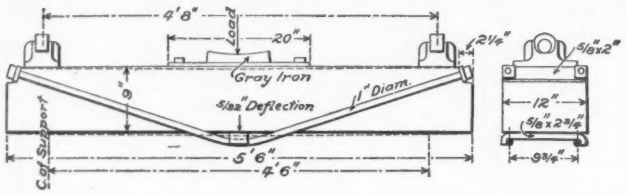
In the design of the bolster here illustrated for the first time it has been the purpose to so construct it that it will interchange with any standard without material expense. In common practice wooden bolsters for diamond trucks are reduced to six or seven inches in depth at the ends, and at the center are about 12 inches deep, or more, when trussed. The depth at the end would regulate that in the middle, in using a rolled section, but six or seven inches depth in the middle would not give enough strength without an excessive quantity of material. But with the advance in the art of pressing irregular shapes, this difficulty appears to have been successfully met. Whatever the depth at the end, a sufficient depth in the middle can be obtained, designing the whole beam on the best lines for carrying the load. The width can be easily varied by making the tie plates of the proper length. Thus this bolster can be readily made interchangeable, and it would be apparently an easy matter to substitute it in repairs for a wooden bolster. The cost of repairs would not be much greater in this substitution, and the metal bolster would doubtless last at least as long as the car. The bolster shown is riveted under hydraulic pressure, insuring the filling of the riveted holes.

The manufacturers claim that there is a positive advantage in making the bolster in several pieces, as shown. For instance, if a center plate becomes distorted, it can be replaced for about $1, the column guides can be replaced for about 20 cents each, and so of other parts.

It is a fact that engineers almost universally use mild steel in bridge construction. The functions of a car bolster are much the same, as both must withstand shocks; and it would appear that the introduction of mild steel bolsters was a movement in the direction of economy and safety.

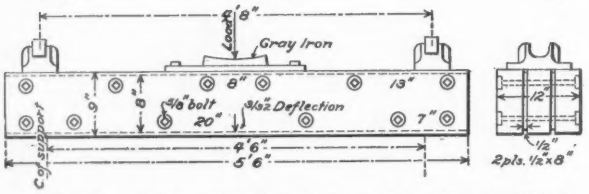
The M. C. B. committee of 1893 arrived at the conclusion that with the bolsters tested the deflection "was of an extent to cause us to decide that none of them had any factor of safety whatever and allow of free curving of the truck," and further, the committee says that there was a general "expression that it is very important that truck bolsters be constructed with a view to securing a greater factor of safety, and many freely stated that they found more defects in bolsters of freight trucks than in any other item of the truck." The committee also says: "The committee made a personal inspection of 61 different styles and makes of freight trucks largely composed of wood transoms and bolsters, and every truck was more or less defective on account of the parts shrinking, causing loose bolts, and many other parts split, checked, cracked, splintered, worn away, warped, etc., and we therefore recommend that timber not thoroughly seasoned is unfit for car truck construction to produce economical results; and as builders cannot use seasoned timber, we would recommend the introduction of steel or wrought iron in place of green, unseasoned timber." The committee of 1894, returning to this subject, speaks of the American cast-steel bolster truck as having practical features, and being worth the particular attention of the Association.

It is probably not necessary to make any argument now as to the importance of a bolster stiff enough to keep the load off the side bearings, but the following recent experiment emphasizes the point. It was made by a Superintendent of Motive Power of a prominent railroad. He had a train of 20 loaded freight cars hauled at a given speed on slight up grade. Coming to a curve the train came to a standstill. He then dropped off one car and backed the train, and made a fresh start. It again came to a standstill at the curve. He dropped off another car, and again made the effort as before, and failed to get around the curve. He then dropped off the third car, and this time succeeded in getting around the curve. He then took a train of empty cars, aggregating the same number of tons hauled as did the 20 loaded cars, and somewhat to his surprise, he found that the engine hauled them around the curve; knowing, as he did, that it was impossible to haul the same number of tons of empty cars as it was of loaded cars, for reasons that are obvious, viz.: the extra friction on account of having double or treble the number of journal bearings, and the extra friction of wheel flanges against the rail occasioned by the extra number of cars. He then set to work to ascertain the cause of his being able to do what had heretofore been considered impossible, and found upon investigation that he had more friction on the 20 cars than he had on the load of empties, because they were all down hard on the side bearings, and in getting around the curve, of course, the body and truck would be out of line for the moment, and the side bearings had to move on each other, and this



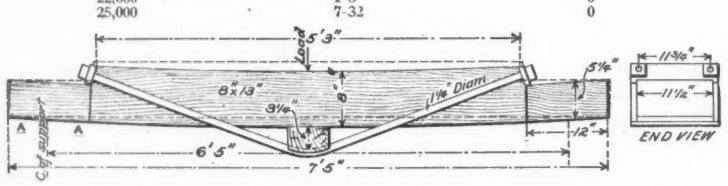

Wood Bolster Trussed Outside of Side-Bearings; for Iron Body-Bolster.
*Capacity of Car 40,000 lbs.*

| Load. lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 20,000 | 5-32 | 0 |
| 22,600 | 5-16 | 1-16 |
| 25,000 | 3-8 | 3-32 |



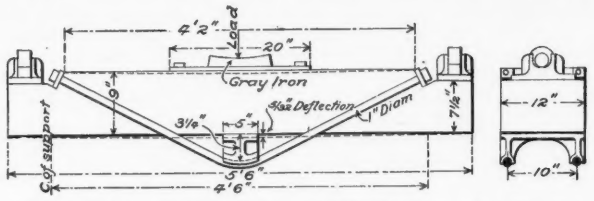

Combination Bolster (2 1-2 inch Iron Plates); for Iron Body-Bolster.
*Capacity of Car 40,000 lbs.*

| Load. lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 20,500 | 3-32 | 0 |
| 22,000 | 1-8 | 0 |
| 25,000 | 7-32 | 0 |



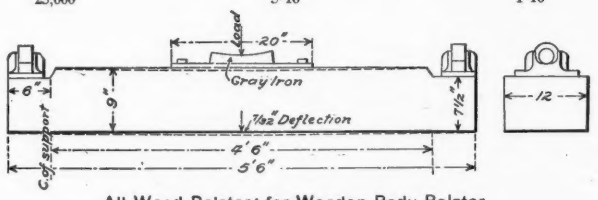

Rigid Truck Bolster. Car of 50,000 lbs. capacity, in service two years.
A. A. *Springs: Inner Coil 1-2 inch Permanent Set.*

| Load. lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 25,000 | 1 3-8 | 1 1-4 |



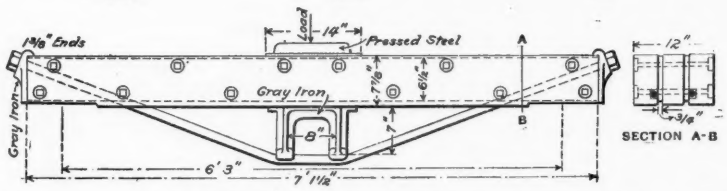

Wood Bolster Trussed Inside of Side-Bearings; for Wooden Body-Bolster.
*Capacity of Car 40,000 lbs.*

| Load. lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 20,500 | 5-32 | 0 |
| 22,000 | 7-32 | 1-32 |
| 25,000 | 5-16 | 1-16 |



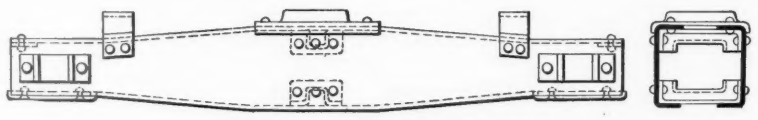

All Wood Bolster; for Wooden Body-Bolster.
*Capacity of Car 40,000 lbs.*

| Load. lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 20,500 | 7-32 | 1-32 |
| 22,000 | 9-32 | 1-16 |
| 25,000 | 13-32 | 1-8 |




Combination Trussed Bolster. Two 3-4 inch plates, 6 1-2 inches wide. Two Truss Rods, 11 1-8 inches diameter.
*Capacity of Car, 60,000 lbs.*

| Load, lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|
| 15,000 | 1-32 | 0 |
| 20,000 | 3-32 | 0 |
| 25,000 | 1-8 | 0 |
| 35,000 | 9-64 | 0 |

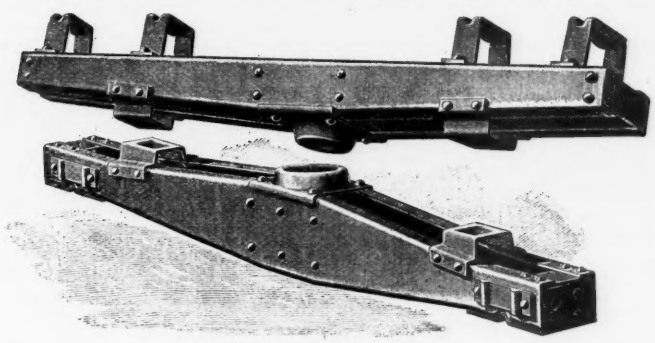


The Diamond Pressed Steel Bolster.
*Capacity of car, 60,000 lbs.*

| TEST BY MAKERS. Load. lbs. | Deflection. in. | Permanent Set. in. | TEST BY R. W. HUNT COMPANY. Load lbs. | Deflection. in. | Permanent Set. in. |
|---|---|---|---|---|---|
| 26,000 | .00 | .00 | 26,000 | .02 | — |
| 46,800 | .08 | .00 | 36,400 | .04 | — |
| 55,900 | .11 | .00 | 46,800 | .09 | — |
| 65,000 | .14 | .00 | 55,900 | .11 | — |
| 75,400 | .16 | .00 | 65,000 | .12 | — |
| 85,800 | .19 | .00 | 75,400 | .15 | — |
| 94,900 | .21 | .00 | 85,800 | .19 | — |
| 100,100 | .24 | .00 | 94,900 | .21 | — |
| 110,500 | .25 | .00 | 100,000 | .23 | — |
| 120,900 | .30 | .00 | 105,800 | .25 | — |
| 124,800 | .34 | .00 | 110,300 | .27 | — |
| 136,500 | .40 | .00 | 114,400 | .27 | — |
| | | | 120,900 | .31 | — |
| | | | 124,800 | .37 | — |
| | | | 130,000 | .44 | — |
| | | | 136,500 | .46 | — |
| | | | 143,000 | .57 | .40 |
| | | | 149,500 | .82 | .62 |
| | | | 156,000 | 1.17 | .97 |
| | | | 162,500 | 1.95 | 1.75 |

movement was retarded because of the several tons load possibly on each side bearing, proving thereby, apparently, that if the bolsters of a car are sufficiently strong under all circumstances to keep the body and truck side bearings apart, a much greater load can be hauled. In this case it appeared to be a difference of three loaded cars in a train of 20.

This experiment, taken in connection with the illustrations of average bolsters, seems to point conclusively to the fact that the cars now in use are nearly all down on the side bearings when loaded after being in service a comparatively short time.



The Diamond Pressed Steel Bolster.
*Made by* THE SCHOEN MANUFACTURING CO., *Pittsburgh.*

We are informed that the company is meeting with considerable success in the introduction of the Diamond pressed steel bolster.

## Rating Train Loads by Weight.

The reader will remember an interesting report on this subject printed in the *Railroad Gazette* of January 4. Among the railroads that have lately experimented in this direction is the Pittsburg, Cincinnati, Chicago & St. Louis, and the Superintendent of the Pittsburgh division, Mr. J. J. Turner, has favored us with a copy of a table, shown herewith, which has been issued for use in loading freight engines on his division, prepared after making 12 tests with one of the company's class "R" locomotives on a 5-mile grade.

These experiments were made by a committee consisting of Messrs. H. F. Bickell, R. E. McCarty, A. Mendenhall and C. B. McCormick, and they occupied parts of three days. The weather was dry and fair on each of the three days and the temperature moderate, so that the results would afford a good basis for loading engines in summer as well as winter. There was no wind. The principal results are shown in the following table:

TESTS OF FREIGHT ENGINE NO. 163 (CLASS R).—COLLIERS, PA., TO DINSMORE, PA.—*Distance, 5.7 miles; ruling grade, ascending, 1 per cent.*

| Test No. | Date and Hour. | Cars. Loaded | Cars. Empty. | Weight, Tons. Car. | Lading. | Total | Time mins. |
|---|---|---|---|---|---|---|---|
| 2 | Dec. 13 11.05 a.m. | 16 | 0 | 225.9 | 468 5 | 694.4 | 35 |
| 7 | Dec. 14, 10 08 a.m. | 10 | 19 | 416 7 | 263.2 | 679.9 | 33 |
| 10 | Dec. 14. 3.15 p.m. | 0 | 46 | 659.7 | .... | 659.7 | 34 |
| 12 | Dec. 15. 10.31 a.m. | 0 | 59 | 696.7 | .... | 696.7 | 49 |

The precise distance from Colliers to Dinsmore is 5.7 miles, and the total ascent is 264 ft., equal to an average of 46.3 ft. per mile. Starting from Colliers the grade to Paris Road, about one mile, is 14.7 ft. per mile; thence to Bridge 33, about a mile further, it is undulating, part of the way 45.9 ft. and part 32.7 ft. From Bridge 33 nearly to Dinsmore it is 51.4, and then for a short distance at the end, 52.8 ft. The road is crooked.

The engine used weighed 57¼ tons, of which 50¼ tons were on the drivers. The driving wheels were 50 in. in diameter, and the cylinders were 20 in. x 24 in. The steam pressure was 140 lbs. per sq. in. Of the loaded cars used in the test, 20 contained more than their marked capacity, while two were not loaded up to their full capacity.

In trial No. 1 the engine was loaded with about 950 tons, and it was stalled at Bridge 33. Cars had to be taken off twice, so that test No. 2, the first shown above, was made with 16 cars. In test No. 3 three of the 16 loaded cars were taken off and eight empties put on, the gross weight remaining about the same, but the engine was stalled when it struck the 51 ft. grade, and a car was cut off. Two more attempts had to be made, a car being cut off each time, and Dinsmore was reached finally with 13 loaded cars and five empties. The average speed to the point where the engine was stalled was 11 miles an hour. Tests 4, 5, 6 8 and 9 were made with varying proportions of loaded and empty cars. In test No. 10 the whole train was made up of box cars, and in test No. 12 all were gondolas.

The third test, the main points of which we have just given, tends to confirm the theory that an engine can haul a greater number of tons in a few vehicles than it can in a larger number. A comparison of the second test with test No. 12 might at first seem to indicate the opposite, as the 59 cars weighed more than the 16 cars and their loads. While this, however, can be explained so as not to do violence to a reasonable theory, still it helps to make plain how it is that sometimes a perfectly sound theory gets buried out of sight. In the first place, the time consumed with the train of empty cars was 40 per cent. greater than that taken in test No. 2; and in the second place, the curves on that part of the road where this test was made are so frequent and so sharp, and the tangents are so short, that the resistance due to curvature, as well as that due to other inequalities, or unfavorable circumstances in the track, never get a chance to affect long trains all at once, whereas the short train might be, and was, wholly upon a sharp curve at one time; and it is a fact that the train in test No. 2 nearly stalled the engine on some of the curves, while, on the other hand, the speed of the train of empty cars was nearly uniform throughout the five miles. On a straight and perfect track, therefore, the engine could haul more than 679 tons of fully loaded cars, and probably haul them faster than it did the 59 empties, though the direct evidence of this must be looked for in tests 3 and 10. It is to be hoped that Mr. Turner will straighten out some of the kinks in his track, and then give us some further tests.

The table for rating engines has now been in use for a month with considerable satisfaction. Where the actual weight of a car cannot be ascertained, estimated weights are used as follows: Refrigerator cars, empty, 23 tons, loaded 36 tons; anthracite coal (lading) 30 tons a car; live stock 15 tons; merchandise 10 tons.

The committee recommended that conductors should not only know the weights of cars and lading in their trains, and report the same to the yard master at the end of their trips, but should also compute the number of cars which it would be necessary to detach at that point to reduce the train to the right size for the next division (at places where such reduction usually is necessary).

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY; RATING OF FREIGHT ENGINE LOADS.

Tons of 2,000 lbs.

| | Between Pittsburg & Collier, [1]. Class of Engines. | | | | Between Collier & Dennison, [2]. Class of Engines. | | | | Between Dennison & Newark, [3]. Class of Engines. | | | | Newark to Columbus, [4]. Class of Engines. | | | | Columbus to Newark. [5]. Class of Engines. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R | S & X | I & P | E & O | R | S & X | I & P | E & O | R | S & X | I & P | E & O | R | S & X | I & P | E & O | R. | S & X | I & P | E & O |
| A.... | 900 | 625 | 575 | 425 | 950 | 850 | 775 | 650 | 1400 | 1250 | 1150 | 950 | 1000 | 900 | 825 | 625 | 900 | 875 | 750 | 600 |
| B.... | 670 | 595 | 545 | 395 | 920 | 820 | 745 | 620 | 1370 | 1220 | 1120 | 920 | 970 | 870 | 795 | 595 | 870 | 845 | 720 | 570 |
| C.... | 640 | 565 | 515 | 365 | 890 | 790 | 715 | 590 | 1340 | 1190 | 1090 | 890 | 940 | 840 | 765 | 565 | 840 | 815 | 690 | 540 |
| D.... | 610 | 535 | 485 | 335 | 860 | 760 | 685 | 560 | 1310 | 1160 | 1060 | 860 | 910 | 810 | 735 | 535 | 810 | 785 | 660 | 510 |
| E.... | 580 | 505 | 455 | 305 | 830 | 730 | 655 | 530 | 1280 | 1130 | 1030 | 830 | 880 | 780 | 705 | 505 | 780 | 755 | 630 | 480 |
| F.... | 550 | 475 | 425 | 275 | 800 | 700 | 625 | 500 | 1250 | 1100 | 1000 | 800 | 850 | 750 | 675 | 475 | 750 | 725 | 600 | 450 |
| G.... | 520 | 445 | 395 | 245 | 770 | 670 | 595 | 470 | 1220 | 1070 | 970 | 770 | 820 | 720 | 645 | 445 | 720 | 695 | 570 | 420 |
| H.... | 490 | 415 | 365 | 215 | 740 | 640 | 565 | 440 | 1190 | 1040 | 940 | 740 | 790 | 690 | 615 | 415 | 690 | 665 | 540 | 390 |

[1]. Grade 52.8 ft. per mile. [2]. Grade 40 ft. [3]. Grade 26.4 ft. [4]. Grade 47 ft. [5]. Grade 49 ft. The letters A, B, C, etc., indicate different conditions of weather.

## The Page Car.

[WITH AN INSET.]

*Descriptive.*—Simplicity, strength and conformity to the recognized standards, as far as general efficiency would admit, was foremost in the mind of the inventor when he designed the Page car. He aimed at a design that would admit of the most common construction of truck, drawbar, brake and car body, while providing strong tipping boxes for carrying the load perfectly secured against dumping when loaded; which could be readily unlocked and could be unloaded and restored for loading by a direct manual lift.

Six boxes carry the load, and by means of a toggle joint connection they may be made to operate in pairs, discharging the load of a pair on opposite sides of the car at the same time. By removing the toggle joint connection each box may be operated separately.

Each pair of boxes is enclosed in a casing consisting of an open frame work at the ends of the boxes to which the locking mechanism is fastened and doors hinged to the frames and adapted to close the outer sides of the boxes.

The boxes are mounted on the outer sill of a car of ordinary length, the sill being placed at a suitable distance from the center of the car. Each box is supported for its entire length on the leg of a steel angle bar, which is bolted centrally to the under side of it and which constitutes the axis on which it turns in dumping. The axis is placed so that the loaded box will over-balance slightly to the outside of the car. A thin plate of metal intervenes between axis and sill to prevent crush and wear of the timber. The axis projecting at each end of the box abuts against a cross-sill faced with iron, and is held in position by a trunion keeper fastened to the cross-sill, the pivotal connection being thus simple and strong.

The boxes are secured in an upright position by gravity lock-levers, fixed to each end of a central shaft passing between the backs of the boxes just below the upper edge thereof. The lock-levers engage keepers fixed to each corner of the box in such a way as to form a positive lock. The lock for both corners being fixed to the same shaft, raising one raises the other and both ends of the box are released simultaneously. One of the lock levers may be secured in a horizontal or locked position by a button at the outer end, and when the locks are in engagement, the box being locked at each end and at the furthest remove from the pivotal point, the load is as secure as it would be in a gondola car.

The lock shaft for one of the boxes of a pair consists of a round steel rod journaled at the ends in bearings on the casing above referred to. The lock shaft for the other box of the pair is a tubular sleeve passing over the first named shaft.

The sides of the casing above mentioned constitute the doors which close the open sides of the boxes. They are hinged at the top to the casing ends in a slot which admits of their sliding out at the top and swinging out at the bottom when the boxes tip, and they are held in position when the boxes are locked by keepers on the box floor engaging the lower end of straps on outside of door and by the hooked portion of the hinge engaging lug on box ends near the top. The door fittings are all fixed parts and act automatically.

Each box is provided with two lever sockets for the insertion of a lever of the simplest construction, and each car has three levers, which may be carried in brackets on the casing.

By turning a button above the door hinges the door may be lifted off and removed, to facilitate loading. In unloading it is only necessary to raise lock-lever and lift on box lever, the operator standing on cross timber above boxes. His position gives him a good leverage, and when properly loaded one good man can readily tip and restore boxes, though the appliances admit of four or more lifting on one box.

The construction admits of boxes being dumped to any angle desired, the limit of dump being fixed by bumping blocks fastened to the lower side of the body sills. In practice 40 deg. angle of dump is believed to be sufficient for coal while 45 and 50 deg. is preferable for earth.

*Uses.*—For hauling material for raising track, widening fills and filling trestle the Page car is especially adapted. The door is held up out of the way of the discharging material so that the largest rocks or lumps can leave the car without hindrance. The material is discharged far enough from the rail not to interfere with traffic. No spool or plow car is required to accompany train. A train of these cars can be dumped by the men usually employed to drag back the cable in less time than it will take them to get cable back to plow.

Some of the important uses of this car are: Hauling rubble and building stone for bridge piers and culverts. (The doors can be left off if desired). Hauling bulky material of any kind which it may be desired to unload quickly, even cord wood and railroad ties. It can be constructed so as to carry and dump light, bulky material, such as snow, manure, garbage and waste; also coke.

Hauling ores of all kinds; also building sand, gravel, lime rock and crushed rock for ballast.

The floors of the boxes being horizontal the cars can be used for most of the freight business for which the gondola is used. Coal, sand or gravel can be dumped or shoveled out as may be desired. Only a tilting box car will discharge a load. Material that is at all adhesive will not leave a sloping bottom car by gravity alone.

When material like coal and ore is to be stored or discharged into pockets from which it is chuted into locomotive tenders, boats or cars a self-unloading car of this pattern will effect a saving in trestle elevation over cars delivering between the rails of five or six feet, giving at the same time far greater storage capacity.

It is especially adapted to the delivery of coal at locomotive coaling stations. A low trestle can be erected between main and passing track and the load of the boxes be discharged direct into the locomotive tender, thus effecting a great saving of labor and of breakage of coal.

Two patents have already been granted to the inventor, and more are applied for. One of these cars has been in use for some six or eight weeks in the track elevation work on the C. R. I. & P. and L. S. & M. S., at Chicago. A car is also in service on the lines of the Pennsylvania Co. at Pittsburg, and the manufacturers refer to any of the officials of these companies regarding its merits.

This car is manufactured by the Sheffield Car Co., Three Rivers, Mich.

## Report of the President of the New York Aqueduct Commission from 1887 to 1895.

While it is sometimes annoying to the seeker for information as to current events, to have to do with a Commission conducting a great public work which makes no reports of its actions for a long series of years, and which leaves to the reporters of the daily press the responsibility of narrating the progress of events, one is sometimes tempted to believe that that method is the best on perusal of so good a document as the one which has lately been issued by the New York Aqeduct Commissioners. In a dozen pages there is set forth the entire history of the great work which has been acomplished within the past 12 years by this important board. Detailed descriptions of structures erected and mechanical work done, are, to be sure, not given, nor are there dissertations on the prin-

ciples on which the action of the Board was based, but all events of importance to the public and all personal incidents are stated with a succinctness and clearness that show the writer of the document to be an educated and accomplished man of affairs, capable of viewing in perspective operations over a long series of years, and of setting forth in a terse and forcible manner statements of principle as well as fact. It is doubtful whether such a report as this could have been written if the Aqueduct Commissioners had been accustomed to publish annually statements of the work they had accomplished.

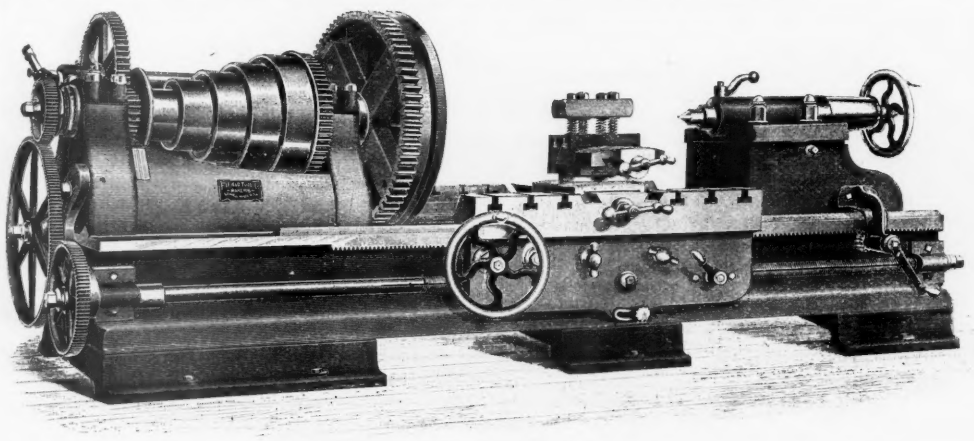
General Duane's report, while nominally only "a brief history of the Commission and review of its work from the 1st day of January, 1887, the date of the last report, to the 1st day of January, 1895," is in fact a history of the entire work of the Commission from January 9, 1883, the date of the resolution passed by the State Senate authorizing the Mayor of New York to appoint five citizens to examine into a plan for an increased water supply.

The Commission as at present constituted came into control of the works on August 1st, 1888, after the completion of the greater portion of the work on the Aqueduct itself, and so far as that structure was concerned their duties have been principally the rectification of the defective work which was found to exist at many points and the final transfer of the Aqueduct to the Department of Public Works, which occurred on June 24, 1891. The work of the Commission, however, as Gen. Duane says, is by no means confined to the building of an aqueduct. It includes also the construction of dams and reservoirs for the storage of the water flowing in the wet seasons from the 360 sq. miles of water-shed tributary to the Aqueduct. There has also come under their jurisdiction the task imposed on the Commissioner of Public Works by what is known as the Water Shed Act of 1893, of acquiring property and suppressing nuisances so as to enlarge the sanitary protection of all water courses contributing to the New York water supply. Two large storage reservoirs, at Sodom and Bog Brook, have been constructed and put into active service. Another, the Titicus, is practically completed and will be filled during the present winter, and the Carmel reservoirs will be completed by next winter. After prolonged discussion, the site and plans for the great storage reservoir at the terminus of the Aqueduct where it receives the waters of the Croton River were decided upon on November 13, 1891, and the contract for the construction of the highest masonry dam in the world, which will be officially known as the "New Croton Dam," was awarded on August 26, 1892, and work upon it has been in progress since that time, not, however, with the vigor which had been expected by the Commission. It is stated that action has been taken by the Commission, which will ensure a better rate of progress in the future.

The amount of work required to thoroughly fit the sites of these reservoirs for the healthful storage of water is enormous, it being necessary to entirely clear all the land which is to be flooded. The magnitude of the work and the thoroughness with which the Commissioners are treating it is indicated by their determination to create a permanent lake at the upper end of the great New Croton Reservoir so as to constantly submerge an expanse of flat territory, the intermittent exposure of which by drawing down the stored water would, it is feared, be unhealthful to persons residing in the neighborhood. The Commission has also taken the preliminary steps for constructing a large reservoir within the limits of the city of New York on the site of the Jerome Park race course, so that it is not unlikely that another period of seven or eight years may elapse before the final report of the Commission can be made.

## A Fifield Engine Lathe.

The engraving shows an engine lathe recently put out by the Fifield Tool Company, of Lowell, Mass. As shown in the engraving it has a 40-in. swing and 12-ft. bed. Beds for this swing of lathe are furnished up to 30 ft. The weight of this tool is about 13,000 lbs. The diameters are: Front bearing, 7 in.; back bearing, 4¾ in.; spindle through cone, 5½ in. The width of cone belt is 5 in; the distance between head and tail stock V's, 22 in.; solid bearing of carriage on ways, 48 in. Lathes from 17 to 64 in. swing are a specialty with this concern. The tool here shown is one of unusual power and efficiency.



Engine Lathe—Fifield Tool Company.

## Train Accidents in the United States in December.

### COLLISIONS.

#### REAR.

2d, on Central of New Jersey, near Lockwood, Pa., a freight train ran into the rear of a preceding freight, wrecking several cars. The engineer was killed and another trainman was badly burned, the wreck having taken fire. There was a dense fog at the time.

4th, on Lehigh Valley, at Neshanic, N. J., a freight train standing at a water tank was run into at the rear by a following freight and 20 cars were wrecked. A brakeman was fatally injured. It is said the engineman of the second train admits that he was asleep.

5th, on King's County Elevated, in Brooklyn, N. Y., near Saratoga avenue, a passenger train ran into the rear of a preceding passenger train, damaging the rear car.

5th, on Eastern Minnesota, near Itasca, Minn., a freight train descending a grade broke apart in three places and the second and third sections afterward came together with sufficient violence to derail three cars.

10th, 11 p. m., on Southern Railway, at Atlanta, Ga., a passenger train ran into some freight cars standing on the main track, doing considerable damage. Two trainmen and one passenger were injured.

12th, 11 p. m., on Union Pacific, at 40th street, Denver, Col., a switching engine ran into the rear of a preceding freight and the engine was overturned. The engineer was fatally injured and the fireman dangerously.

13th, on Brooklyn Union Elevated, at Nostrand avenue, a passenger train ran into the rear of a preceding passenger train, badly damaging the engine and two cars. Several passengers were injured.

16th, on St. Louis & San Francisco, near Pittsburgh, Kan., a freight train ran over a misplaced switch and into some freight cars standing on the side track, wrecking engine and seven cars. The engineer was killed and the fireman injured.

18th, 3 a. m., on Lehigh Valley, at Plainsville, Pa., a passenger train ran over a misplaced switch and into some freight cars standing on a side track, badly damaging the engine and 10 coal cars. Four trainmen were injured. It is said that the switch was maliciously misplaced.

24th, on Pennsylvania road, at Altoona, Pa., a wrecking train which had been admitted to the main track from the yard in the face of a passenger train, was run into at the rear by the passenger train, demolishing two cars of the wrecking train. One employee was killed and eight were injured, one fatally. It is said that the passenger engineman failed to properly control his speed according to a special order that had been given to him, and that the tail lights of the wrecking train had not been placed in position.

25th, on Louisville & Nashville, near Brentwood, Tenn., a passenger train ran into some coal cars which had run out of a side track upon the main line, making a bad wreck. The baggage and express cars were burned up. The engineer, fireman and baggageman were injured.

29th, on Chicago, Burlington & Quincy, at Chicago, a freight train ran into the rear of a preceding freight, wrecking the engine and three cars. The conductor was killed and another trainman injured. It is said that the collision was due to a misplaced switch.

30th, 11:58, on Chicago & Northwestern, at Deering, Ill., a passenger train ran over a misplaced switch and into some freight cars standing on the side track, wrecking the engine and three freight cars. Five passengers were injured, one probably fatally.

And 25 others on 20 roads, involving five passenger and 34 freight and other trains.

#### BUTTING.

2d, on Seaboard Air Line, near Rockingham, N. C., butting collision of freight trains, both running at high speed, making a very bad wreck. One engineman was killed and the other badly injured.

16th, on Southern Pacific, at Houston, Tex., collision of freight trains, damaging both engines and several cars. A car of cotton fell into White Oak Bayou. Two trainmen were injured. There was a dense fog at the time.

25th, on Cleveland, Cincinnati, Chicago & St. Louis, at Culver's, Ind, butting collision of freight trains, wrecking both engines and six cars. One engineer and a tramp were killed.

25th, on Oregon Railway & Navigation, near The Dallas, Or., a passenger train ran over a misplaced switch and into the head of a freight train standing on the side track, making a bad wreck. The freight engineer was killed.

And four others on four roads, involving two passenger and six freight and other trains.

#### CROSSING AND MISCELLANEOUS.

6th, at Seventy-ninth street, Chicago, collision between freight trains of the Chicago & Erie and the Belt Line, derailing several cars. One engineer was injured.

7th, on Wheeling Bridge & Terminal Railway, at Wheeling, W. Va., collision between a freight and a gravel train, wrecking the engine and four cars. Three trainmen were injured.

8th, on Southern Pacific, near Duson, La., a passenger train ran into a freight train which was entering a side track, badly damaging the engine and wrecking several cars. A mail clerk was injured.

15th, on New York & New England, near Stillwater, R. I., collision of freight trains, killing a brakeman.

23d, on Southern Pacific, near Raceland, La., collision between a passenger train and a freight train which was entering a side track. The fireman of the passenger train jumped off and was killed and two other trainmen were injured.

23d, at Inter Bay, Wash., a locomotive of the Great Northern ran into a freight train of the Seattle, Lake Shore & Eastern at the crossing of the two roads, throwing 12 cars into the bay. Two employees were injured.

25th, at Waxahachie, Tex., a passenger train of the Missouri, Kansas & Texas ran into a passenger train of the Houston & Texas Central at the crossing of the two roads, wrecking one passenger car. Four trainmen and 13 passengers were injured, two of them fatally. It is said that the air brakes on the M. K. & T. train were ineffective in consequence of the train pipe having been closed immediately behind the tender. It has not been discovered how the cock in the train pipe came to be in this position.

27th, near Ashland, Pa., collision between a freight train of the Philadelphia & Reading and a passenger train of the Lehigh Valley. A man riding in one of the engines was killed. There was a thick snowstorm at the time.

And 12 others on 11 roads, involving two passenger and 21 freight and other trains.

### DERAILMENTS.

#### DEFECTS OF ROAD.

5th, on Houston & Shreveport, near Keithville, La., nine cars of a freight train were derailed and wrecked. A brakeman was killed and a tramp injured. It is said that the rails spread.

12th, on Milledgeville & Asylum, near Milledgeville, Ga., a passenger train fell through a bridge and the engine and a passenger car lodged in Fishing Creek, 40 ft. below. The fireman was killed and the engineer fatally injured.

24th, on Atlantic & Pacific, near Ashfork, Ariz., a passenger train was derailed by a broken rail and one passenger car was overturned. Several passengers were injured.

26th, at Forty-sixth street, Chicago, a passenger train of the Wabash road was derailed at a defective switch and one passenger was injured.

28th, on Delaware, Lackawanna & Western, near Millington, N. J., a passenger train was derailed by a broken rail and two trainmen were injured.

29th, on St. Louis & San Francisco, near Beaumont, Kan., a mixed train was derailed by a broken rail and the engine and nine freight cars were ditched. The fireman was killed and the engineman injured.

29th, 4 a. m., on Southern Pacific, near Ochoa, Ariz., the "Sunset Limited" express train was wrecked by falling through a trestle bridge which had been weakened by fire, and two sleeping cars were burned up.

29th, on St. Louis & San Francisco, at Burgers, Kan., a freight train was derailed by a broken rail and the engine and nine cars were ditched; engineer and fireman injured.

And eight others on eight roads, involving two passenger and six freight and other trains.

#### DEFECTS OF EQUIPMENT.

10th, on Boston & Maine, near Wells, Me., a passenger train was derailed by a broken axle.

And nine others on four roads, involving one passenger train and eight freight trains.

#### NEGLIGENCE IN OPERATING.

1st, on Manhattan Elevated, New York City, at 135th street and Eighth avenue, a car in an empty passenger train was derailed by the misplacing of a switch under it as it passed. A loaded train ran against the derailed car and it was badly damaged. A man walking on the ground beneath the track was injured by a piece of wood which fell from the wreck.

3d, on Baltimore & Potomac, near South End of Long Bridge, Va., a passenger train approaching the bridge was not properly controlled and was derailed at the derailing switch. The engine, which was running backwards, fell over and the fireman was killed.

And one other, involving one passenger train.

#### UNFORESEEN OBSTRUCTIONS.

10th, on Western New York & Pennsylvania, near Franklin, Pa., a freight train was derailed by running into a landslide, and the engine and 12 cars were ditched. Three trainmen were injured, one probably fatally.

10th, on Great Northern, near Everett, Wash., a passenger train was derailed by a landslide and the cars were badly damaged. A man stealing a ride was fatally injured.

11th, 10 p. m., on Great Northern, near Everett, Wash., a passenger train was derailed by running into a landslide and the enigne fell into the bay. The fireman was fatally scalded.

20th, on St. Louis, Iron Mountain & Southern, at Walnut Ridge, Ark., a passenger train was derailed by running over a cow which had fallen between the sleepers on a trestle, and the engine and first two cars were wrecked; engineer and fireman injured.

And nine others on nine roads, involving seven passenger and two freight trains.

#### UNEXPLAINED.

3d, on Delaware & Hudson, near Port Henry, N. Y., a passenger train was derailed and three cars fell down a bank, lodging in the water of Lake Champlain. The baggageman and mail agent were drowned and five passengers were injured. The occupants of the baggage car and of one of the passenger cars had to crawl out through windows and holes in the roof very quickly to avoid drowning. It is said that the train was running at moderate speed and that no defect was found in the track, cars or engine.

4th, on Philadelphia & Reading, near Myerstown, Pa., several cars in a freight train were derailed and fell against a passenger train running upon the adjoining track, doing considerable damage. A brakeman was injured.

8th, on Texas & Pacific, at Plaquemine, La., a switching engine was derailed and overturned. Eight employees were injured.

9th, on Boston & Maine, at Boston, Mass., a passenger train of the Fitchburg road was derailed at a frog. The smoking car was overturned and a brakeman and one passenger were injured.

12th, 3 a. m., on Southern Pacific, near New England Mills, Cal., a passenger train descending a grade was derailed and the engine and four cars were ditched.

22d, on Oregon Railway & Navigation, at Menoken, Wash., a passenger train consisting of eight cars drawn by two engines was derailed and both engines and the first two cars were ditched. One engineer was killed and two trainmen were injured.

28th, on Chicago, Milwaukee & St. Paul, near McGregor, Ia., a freight train was derailed near a switch

and a brakeman who was at the switch was killed by a car which fell upon him.

And 20 others on 16 roads, involving four passenger and 16 freight and other trains.

OTHER ACCIDENTS.

27th, midnight, on Vandalia Line, near Altamont, Ill., a car in a passenger train was found to be on fire. The train was run to the station and some of the cars were cut off, but two of them were completely destroyed, together with a part of the station platform.

28th, midnight, on Atchison, Topeka & Santa Fe, near Peabody, Kan., the engine of a passenger train was wrecked by the breaking of a side rod and the engineman was badly injured.

And five others on five roads, involving three passenger and three freight and other trains.

A summary will be found on another page.

## The Chicago Drainage Canal.

At the meeting of the Board of Trustees on January 17, the annual reports of the Chief Clerk, Mr. Thos. F. Judge, and Chief Engineer Mr. Isham Randolph were presented. Mr. D. C. Dunlap resigned his position as Assistant Superintendent of Construction, and that office was abolished by the Board. In the report of Mr. Judge the financial statement is as follows:

| | |
|---|---|
| Receipts of the District from organization to Dec. 31, 1893 | $ 5,381,757.78 |
| Receipts for the past year | 7,399 367 93 |
| Total receipts | $12,781,225.71 |
| Expenditures of the District from organization to Dec. 31, 1893 | $ 5,186 504 83 |
| Expenditures for the past year | 6,292.134 85 |
| Total expenditures | $11,478,639 68 |
| Balance on hand Dec. 31, 1894 | $ 1,302,586.03 |

In the report of Chief Engineer Randolph the work is reviewed from its beginning; each section being taken up in detail, and the date of opening of the bids, the awarding of the contract, the estimated amount of material to be excavated, the price per cubic yard of the same, the date of beginning work, the amount excavated to the present time, cost of the same, and any special features noted.

Since January 1, 1894, nine sections have been equipped, and the plant for working them perfected; eight sections have changed hands, and one abandoned by the contractors. On eleven sections only has the work been vigorously prosecuted. In 1895 the work will begin with 28 sections equipped, and much greater progress is predicted, the completing of the work being expected in the fall of 1896. A safe estimate of the value of the machinery used by the contractors is placed at $3,000,000.

The rate of progress of the work reached a maximum in August, when the amount earned by the contractors was $666,481.81, and since then the average has been $568,031.32 per month.

Several plans have been proposed and considered for the controlling works at Lockport, the one combining the greatest advantages and least cost being a combination of lifting gates, and a section of bear trap dam. There will be eight of these gates, working between solid masonry piers, the gates being raised vertically by mechanism operated from bridges spanning the space between the piers. Each space will be 30 ft. wide, and dam 160 ft. between bulkheads. The estimated cost is $160,000.

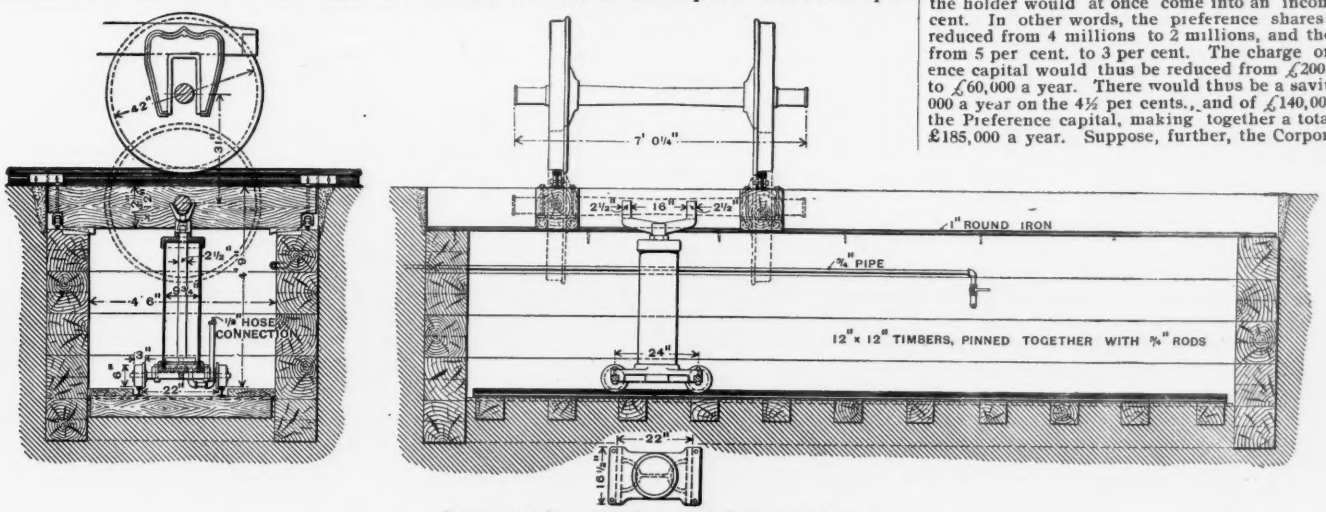
One of the special features noted in the detailed report of sections is the performane of two hydraulic dredges on section "B." The two dredges excavated 1,538,387 cubic yards in 882½ working days, or an average of 1,731.9 cubic yards per day each. The total removed to January 1, 1895, is 12,608,806 yards of glacial drift, and 5,358,968 yards of solid rock, or 48 6-10 per cent. of the glacial drift, 43 57-100 per cent. of the rock, and 45 43-100 per cent. of the entire work.

## A Pneumatic Drop Pit for Passenger Car Repair Yards.

The engravings show a pneumatic drop pit which is in use in the passenger repair yards at several division stations on the Baltimore & Ohio Railroad. It is reported that the arrangement is very convenient and the operation very satisfactory. The pit was designed in the office of Mr. W. H. Harrison, Superintendent of Motive Power at Newark, Ohio, by Mr. C. M. Thompson, Division Chief Draughtsman.

The interesting parts of the design are the pneumatic lift, its details and the method of making connection to the air supply. The track in the pit is 22 ins. gage. The truck, four-wheeled and made entirely of iron, supports the air cylinder, the truck casting and the lower head of the cylinder being one piece. The cylinder is a 36-inch length of extra heavy 10 inch wrought-iron pipe. It is turned smooth inside to receive the piston.

The piston rod passes through the top head and the metal of the head is thickened by a flange around the hole; no attempt is made to make this a tight joint because the air pressure is exerted only on the under side of the piston. The piston rod is made a close fit in the cylinder head for a guide and when the piston is in the lowest position the shoulder of the axle fork rests on the upper cylinder head. The piston rod has a double-forked end to receive the axle. The piston packing is a leather gasket between two followers. The air supply is conducted by a pipe to a point in the pit about midway of the travel of the truck. At this place is located the operating valve, and the connection between the valve and cylinder is made by a flexible hose.




Pneumatic Drop Pit—Baltimore & Ohio Railroad.

Each stringer which carries the portable section of the track rails over the pit is carried on four 4-inch grooved rollers; the rollers run on 1-inch round iron rails which are laid lengthwise on the side timbers of the pit; the weight of the stringers transferred to the rollers by means of a fork, the two legs of which take the journals of the rollers and the tail extending up through the timber. No heavy loads are carried on these rollers; the notched wedges under the stringer carry the portable rail and any load there may be upon it. The weight is on the rollers only when the portable section is being removed preparatory to using the pit.

## Manchester Ship Canal.

Early in December the *Statist*, an English financial and commercial journal of considerable repute, brought forward a proposition for a settlement of the Manchester Ship Canal financial difficulty. With regard to the talk of a purchase of the canal by the railroad companies it is argued that this is not to be permitted. The canal was built to secure facilities and to reduce rates by competition with the railroads, and great sacrifices were made to secure this competition which it would now be unwise to throw away. The *Statist* continues:

"We conclude, therefore, that the Manchester Corporation ought not to allow a sale of the Canal to the railway companies. If it does not, then it is the duty of the Corporation to take measures itself which will put the Canal Company on a more satisfactory footing. Practically, the Canal Company is now in the power of the Corporation. The Corporation can decide the fate of the Canal Company one way or the other, and, having gone so far, it is bound, in the interests of its own constituents, to go considerably farther. In other words, it seems to us that the Manchester Corporation ought itself to take over the Canal and work it.

"According to the last report of the Canal Company—that for the half-year ended with June—the total capital of the Company amounted on the last day of the half-year to £15,412,000, of which 4 millions consisted of Ordinary shares, 4 millions of Five per Cent. Preference shares, and £6,900,000 of loans. Of the loans, again, £2,407,000 are 4 per cents., and £4,493,500 are 4½ per cents. Capital expenditure is still going on, and, therefore, at the end of the current half-year the capital will be larger. But we leave that out of account for our present purpose, and say, roughly, that the share capital amounts to 8 millions, and the loans to 2½ millions of 4 per cents., and 4½ millions of 4½ per cents.—in other words, 8 millions of shares and 7 millions of loans. Now, the 2½ millions of 4 per cents. impose an annual charge for interest alone of £100,000. The 4½ millions of 4½ per cents. require £202,500; and the 4 millions of 5 per cent. preference shares require £200,000. In all, the mere interest charge amounts to £502,500. This is leaving out of account the half-million which the Company still has power to borrow, and also of provision for sinking-fund, depreciation, and the like.

"Before the Ordinary shares come within sight of a dividend, consequently, the Company requires to earn its working expenses, and over half a million annually besides, taking no account of additions to capital, of sinking fund, depreciation, or reserves. Is it not clear that the Company is absolutely over-capitalized, and that it is in the interest of all parties to reduce the charge? How can that be done? Manifestly, it is only to be done by the city of Manchester. Nobody else is powerful enough. The city of Manchester had already lent 4½ millions at the end of June, and no doubt at the end of the year it will have lent 5 millions. But let us confine ourselves to what it had done at the end of June. The 4½ millions bear 4½ per cent. interest. But the credit of Manchester is good enough for the Corporation to borrow at 3 per cent. Is it reasonable for the city to exact so large a profit from an enterprise which the world is assured is to be of incalculable benefit to the Manchester community? We venture to say it is not. The city of Manchester ought to receive from the Company what it actually pays itself, and a sinking fund provision. Suppose, then, it were to charge the Canal Company, not 4½ per cent., but 3½ per cent., there would be a saving of 1 per cent. upon 4½ millions at once, or £45,000 a year. And this saving would be effected without loss of any kind to the city or its ratepayers.

"But if the Corporation were public-spirited enough to do this, it might fairly ask the holders of the 4 per cents. to forego a portion of their interest. Would the holders agree? We need not now suggest an answer. Even if they refused, and the Corporation shrank from taking measures to compel them to submit, it has full power to deal with the shareholders. If it were to offer the preference shareholders Manchester Corporation Bonds for half the amount of their capital, bearing 3 per cent. interest, would not the offer be a good one for the preference shareholders? The bond would be at once worth par, and the holder would at once come into an income of 3 per cent. In other words, the preference shares would be reduced from 4 millions to 2 millions, and the dividend from 5 per cent. to 3 per cent. The charge on the reference capital would thus be reduced from £200,000 a year to £60,000 a year. There would thus be a saving of £45,000 a year on the 4½ per cents., and of £140,000 a year on the Preference capital, making together a total saving of £185,000 a year. Suppose, further, the Corporation were to offer the Ordinary shareholders 25 per cent. of their capital in the form of a Corporation bond, bearing 3 per cent., the bond would be at once worth par, and the shareholder would at once come in for an income. It seems to us that the shareholders, both Preferred and Deferred, would get a great benefit. The Canal Company would be immensely benefited, for the share capital would be at once reduced to 3 millions from 8 millions, while the interest charge on the existing debt would be reduced by £45,000 a year. But, it will be said, the ratepayers would be burdened with £60,000 a year for the Preferred shareholders, and £30,000 a year for the Ordinary shareholders, or together £90,000 a year. No doubt they would. The question is—Have they faith enough in the earning powers of the Canal, and in the advantages it will confer bye and bye upon Manchester, to incur a present annual charge of £90,000 a year, with the prospect of a large revenue hereafter, and an immense stimulus to the trade of the district?"

A correspondent in Manchester, an engineer of weight and distinction, writes with regard to this:

"I shall be very much surprised if the Manchester taxpayers would ever face the burden of raising, for several years at the least, the interest on £10,000,000, for that would be the amount of capital if written down as proposed, and even if secured at 3 per cent. it would be a frightfully heavy dead-weight for a city like Manchester to carry. Assuming that the Canal has paid working expenses this year (which I very much doubt) and the managers can succeed in increasing the traffic at the rate of £1,000 a week, or say £50,000 a year, it would take six years for the Canal to pay expenses, and in the meantime Manchester ratepayers would have had to pay in five years £750,000 for interest charges, excluding any idea of fresh capital being required for increased equipment to accommodate increased traffic.

"I believe some public trust will ultimately be formed with power to issue bonds secured over by the rates, of not only the city of Manchester, but the whole area benefited by the construction of the Canal."

## Street Car Fenders.

On Oct. 6, 1894, the City Council of Baltimore passed an ordinance compelling the various street railroads of that place to equip all of their cars with fenders before Jan. 8, 1895, or pay a fine of $5 a day for each car not so protected. The ordinance requires that the railroad companies "shall provide for each car or train of cars a car fender or fenders, with both front and wheel guards, of a design which the Mayor and City Commissioner shall have certified in writing to, which in their judgment comply with the requirements set forth in the report made to the commission appointed under the provisions of the resolution of the Mayor and City Council, approved April 28, 1894, by Mendes Cohen, engineer to the commission." On the expiration of the time allowed only one company had fully complied with the law, which resulted in the arrest of the Superintendents of three lines. They were each released in $500 bail. It is not likely that the trials will result in a conviction, as the railroads involved have proved that they are equipping their cars as fast as fenders can be made.

The Commissioners of the District of Columbia are preparing regulations in regard to fenders which require that every cable and electric railroad company in the District shall equip its cars in a satisfactory manner with fenders within 45 days from the promulgation of the regulations. No special fender is made official, but all fenders used must be subject to the approval of the commissioners.

RAILROAD GAZETTE

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## EDITORIAL ANNOUNCEMENTS.

**Contributions.**—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

**Advertisements.**—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

A couple of weeks ago the *Financial Chronicle* published its review of the gross earnings of the railroads of the United States for the year 1894. Returns from 125 roads for the full year and 69 roads for 11 months showed a falling off of about 112½ million dollars; but this statement did not include a good many roads that are known to have lost heavily, and the probability seems to be that reports from the total mileage of the country will show a decline of $130,000,000. But even this is not the worst, for this decline follows a heavy one in 1893 when the decrease must have been something like $30,000,000, or say $160,000,000 in the two years. But this loss followed a steady increase which in 1892 was about 45 millions; in 1891, 44 millions, and in 1890, 70½ million dollars. The decrease per cent. in 1890 was 11½ and in 1893 it was 3 per cent. It will be remembered, however, that the loss in the first half of the year was very much greater than 11 per cent., having been 21.48 in June and 20.49 in July. There was but one month in the year, August, namely, which showed an increase in gross earnings over the corresponding month of the year before; of the other months December had the smallest loss. Of course the immediate causes of this showing are familiar. The general hard times is the first and greatest; but the labor troubles were unusual, beginning with the great coal strike in the spring, accompanied by the disturbances created by the Coxey tramps, and followed in July by the Pullman strike in which earnings on some great lines practically ceased. Then there were serious and unusual floods, considerable demoralization of rates, short crops and low prices. The corn crop was the smallest in over 10 years, and the seaboard receipts of grain fell off enormously. In 1894 they were less than 154¾ million bushels, in 1893 they were 211½ millions, in 1892, 277⅓ millions, and in 1891, 233½ millions. The grain receipts at Chicago were about 54 million bushels less than in 1893, and 60 million less than in 1892. Provision receipts, however, were generally greater. The cotton movement, notwithstanding the unexampled low prices, was considerably above the normal which helped out the southern and southwestern roads. Nearly 1¼ million bales more cotton were received at the southern ports in 1894 than in 1893, most of the gain being in the last three months of the year.

### The Secret Ballot in the American Society of Civil Engineers.

Owing to certain unfortunate semi-political conditions in the city of New York, the action of the American Society of Civil Engineers in taking steps to amend its constitution in the matter of the reconsideration of an adverse vote on a candidate for membership has attracted a great deal of attention in the daily newspapers, not only in New York but all over the country. We hear of it from Tennessee and from Texas; and probably we shall hear of it from San Francisco before long. The most general version that we see is that the committee on amendments recommended the preservation of the secrecy of the ballot; that there was considerable effort to have the ballot signed, but that the Society sustained the committee, and that therefore the ballot remains absolutely secret.

While all of this is no business of the general public, yet we think it well to say, for the information of the daily papers, as well as for the information of such members of the Society as have been misled by the press reports, that this is almost all not so. On the contrary, the committee recommended no material change in the method of securing a reconsideration of an adverse ballot against a candidate, or of the method of taking the ballot, except in one important particular. The committee did recommend that any member voting in the case of reconsideration be required to sign his ballot. The meeting adopted this recommendation of the committee and ordered it to be passed to letter ballot. The constitution is not yet changed in this respect, but the members of the Society will have an opportunity to make the change if they think best.

We agree entirely with the committee and with the speakers who supported them in the meeting in this particular.

As a matter of fact, there is very seldom any good reason why a man should be blackballed in the American Society of Civil Engineers. If the members will do their duty in sending to the Secretary a statement of known facts of a character to disqualify a man from membership they may be very sure that that man's name will not be passed to ballot. Of course the Board of Direction must always use its discretion as to what is evidence, and it must often pass to ballot a man who seems in the opinion of some member not to be eligible, even after that member has expressed by letter to the Board his adverse opinion. But it can very seldom happen that the name of a candidate goes to ballot when serious and respectable evidence of his ineligibility has been sent in.

The difficulty is in the American Society of Civil Engineers, as in a great many clubs and like organizations, that members are careless or lazy or cowardly and do not put the Board in possession of the evidence against a candidate. Then he is blackballed; or if he is elected the careless or cowardly members growl about it. We should be sorry to see any less secrecy than is at present observed in regard to the first ballot; but it seems eminently just that when a sufficient number of responsible and respectable members of the Society urge the reconsideration of an adverse vote those who wish still to oppose the candidate should be asked to justify their opposition by reasonable arguments presented to the Board; or should be required to sign their ballots. If we were making a wager we would bet that the amendment will pass.

### The Proposed National Arbitration Law.

Attorney General Olney again appears in the discussion of the relations between railroad companies and their employees, this time as the author of a bill to provide for arbitration in cases of disputes about wages, etc. Mr. Olney finds fault with the bill introduced in Congress, Dec. 18 by Mr. McGann, and has drawn up one himself which has already been introduced in the House by the Chairman of the Labor Committee as a substitute for the McGann bill.

The latter, usually called the Wright bill, it having been drawn up by Mr. Carroll D. Wright, is open to obvious objections, even if one were satisfied that its main purpose would be useful and in the right direction, which is, to say the least, very doubtful indeed. In the first place, the sections of the bill are modelled in their phraseology largely after the Interstate Commerce Act, thus introducing a good deal of superfluous, not to say ridiculous matter. Perhaps this method was adopted as the most delicate and inoffensive way of providing a salary of $7,500 each for the commissioners and one of $3,500 for the secretary.

This question of a commission and the cost thereof is the first point at which Mr. Olney makes a change. He would simply have a temporary commission whenever a dispute arose. The Chairman of the Interstate Commerce Commission and the United States Commissioner of Labor should first try to settle any controversy; and then, in case they failed, there would be a board of three commissioners, the Chairman just mentioned, one man selected by the railroad and one by the employees. In any case where the parties do not submit gracefully to arbitration, or a strike threatens disturbance of public rights the Attorney General of the United States may apply for the appointment of receivers to take charge of the road, which we should suppose must be unconstitutional. At any rate, it opens up an appalling idea of the power of the National Government to seize people's property.

Mr. Olney reiterates his view, expressed in the Philadelphia letter, that the railroads must not proscribe the brotherhoods, must not discriminate against men who refuse to contribute to beneficial funds, etc., and must not, after discharging men, conspire to prevent them from obtaining employment. He would punish any of these acts by a fine of from $100 to $1,000. The bill provides that the award of a Board of Arbitration must remain in force two years, and there is a provision for 30 days' notice of intention to resign or intention to discharge.

The principal effect of Mr. Olney's utterance will probably be about the same as that of the letter which he wrote to Judge Dallas of Philadelphia in November, reminding the judge of the good intentions of the Brakeman's Brotherhood. The present letter (an explanatory letter to the Chairman accompanies the proposed bill) like the earlier one, serves to show that Mr. Olney is of sympathic mind, and that he realizes the woes of "labor;" and it helps to silence the demagogues who pretend to believe that he and the President are prejudiced in favor of capitalists and corporations as against men whose sole wealth consists in "days' works."

But, as appears in various clauses of the bill, Mr. Olney realizes some of the difficulties of the work and wages question, and probably sees as well as any one the improbability, not to say the utter impossibility, of getting any bill through Congress—certainly none can pass at this session—which will much ameliorate the present conditions.

With all the provisions about 30-day notices or six-months notices, we are still without any remedy for the one great obstacle, that employees cannot be legally bound, in any satisfactory way, to carry out their agreements, while the employer, having property that can be attached, can be bound. As long as this rock is in the way, the satisfactory adjustment of disputes must depend upon honor and policy, and it is almost always the absence of honor on one or both sides, generally, we regret to say, on the men's side, which makes the trouble. In view of the improbability of the passage of the Olney bill (or any other) at present, we shall postpone further discussion of it.

But the futility of looking for a panacea in legislation need not discourage those who know of better methods of settling questions between employer and employee. Law or no law, there is ample opportunity to find out whether the brotherhoods are willing to be incorporated and to put themselves on a strictly business basis, so that they can deal with a railroad corporation on terms of equality. If they are not willing, why not? And if they persist in preferring their present position, where the signature of a Grand Chief to a contract is worthless before the law, railroad managers will have good ground for going ahead and making contracts with individual enginemen and conductors, whose signatures *are* worth something. A good many such men would be found available if they were looked for.

### Light Railroads and Standard Gage.

In writing last week of the movement for light railroads in England, we spoke briefly of the matter of the gage, and we ventured to advise that the new lines should be built to standard gage for the reason that the first cost of construction would be but little greater than that of building narrow gage lines, while the economy of operation would be very great. That is to save a little in the interest account the traffic would be taxed for generations to come by a break of gage. We find in a supplementary report of the Railway Commissioners of New South Wales, just received, confirmation of this view.

That body has recommended from time to time a moderate and a judicious extension of light lines into a country of thin traffic, but it has always recommended that these light lines should be built to standard gage. Of this the Commissioners say "they would cost scarcely anything more in the first instance than a narrow gage line, and the whole of the ordinary rolling stock, exclusive of engines, which could be selected from the lightest types existing in the service, could pass over them and thus avoid the great disadvantage of cost of creating a new class of rolling stock." Of course the Commissioners might have added "and thus avoid the delay and cost of transferring freight from one gage to another."

In fact this board brought forward, immediately after taking office, the question of uniform gage for all the Australian colonies, but the matter has made little progress toward an agreement. But the question is one of vital importance to the future of Australia and must be dealt with some time, and the longer it is postponed the greater will be the cost of change, and the greater will be the loss to the country in the discouragement to the free interchange of traffic. In 1889 the Chief Commissioner urged upon the Minister of Railways that the various colonies should unite in affirming that the adoption of a universal gage as absolutely necessary in view of the growth of the country and

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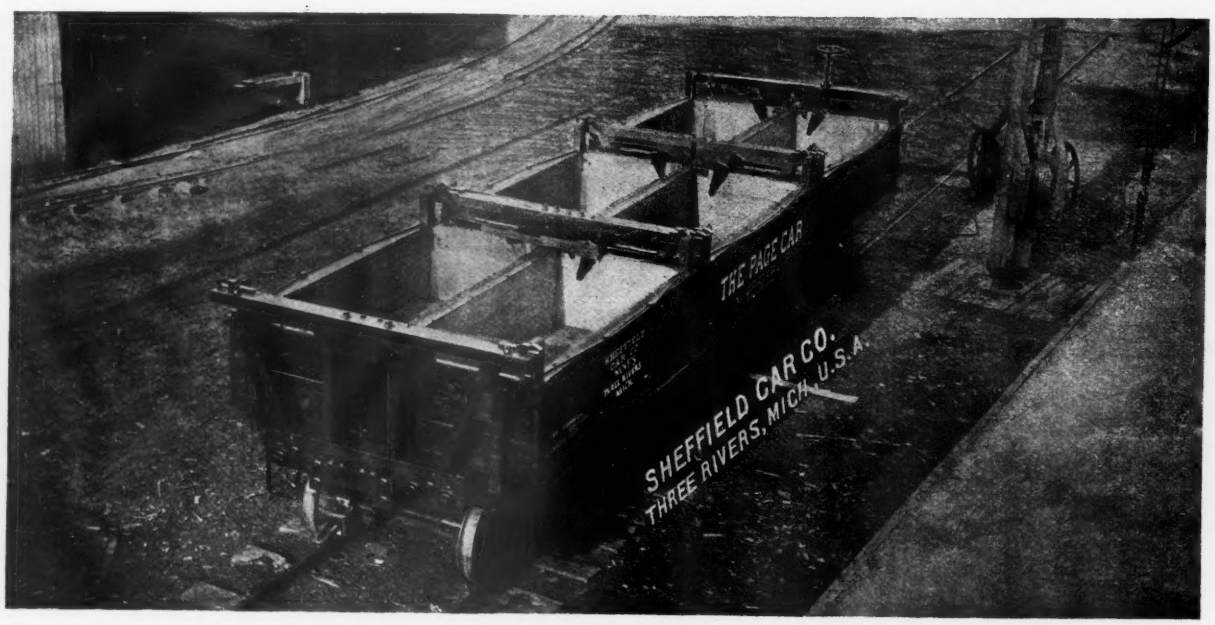


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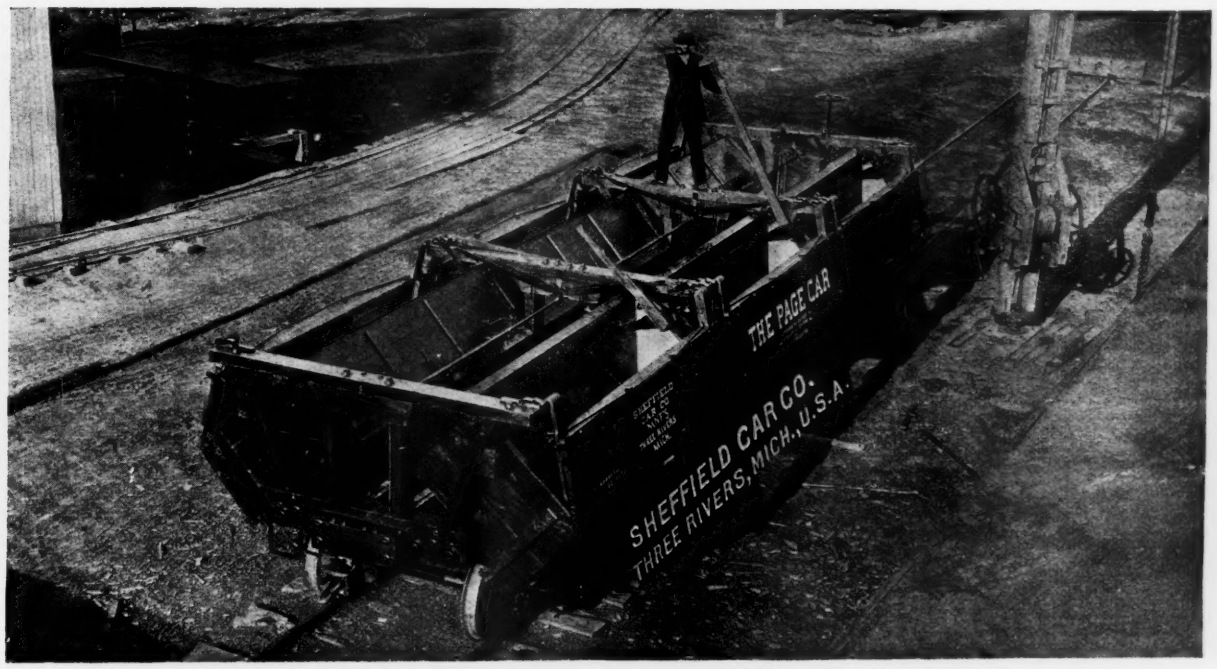


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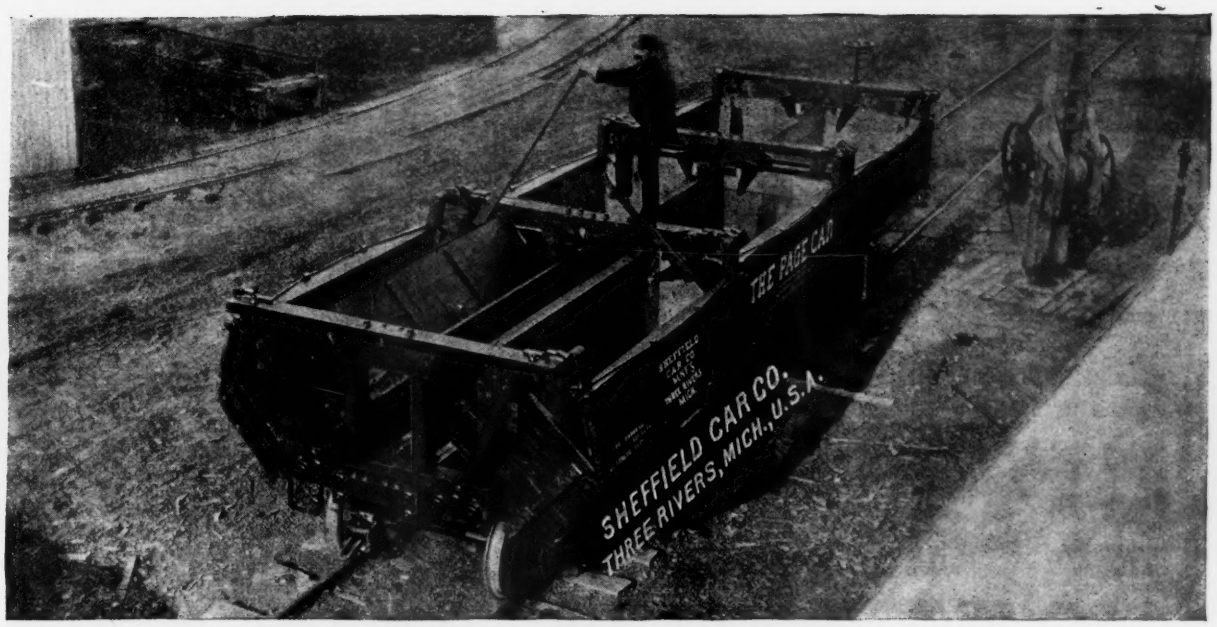


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the increasing intercourse between the colonies. Then the question should be impartially investigated as to which gage, 4 ft. 8½ in. or 5 ft. 3 in. can be adopted with the least cost and inconvenience. It was proposed that a board should be created, to consist of the Chief Commissioner of each colony with one colleague from each colony, to settle the gage to be adopted, the proportion of the cost of change to be borne by each colony, the probable cost of the change, the number of years the cost should be spread over and the date when the change should take place. It was further recommended that each colony which now finds it desirable to build narrow gage lines should arrange its stations, tunnels and bridges with a view to the establishment of the uniform gage eventually, but the wisdom of adopting the standard gage from the outset should be carefully considered.

It appears to us that the lesson of the experience of those colonies now hampered by a variety of gages, and the lesson of the experience of the United States, where a vast mileage has been changed from narrow and from broad gage to standard, at an enormous cost, ought to have weight in the deliberations of those who will decide upon the policy to be adopted now in England. Indeed, we doubt not that these experiences will have due weight, for we have great confidence that, after all the talk is done, the practical sagacity of the Englishman will prevail.

## French Locomotive Boiler Tests.

In another column will be found an account of some experiments made with a locomotive boiler on the Paris, Lyons & Mediterranean Railroad, that are remarkable for their completeness. An account of the first part of these tests was given in the *Railroad Gazette*, July 4, 1890. Perhaps the most important of the conclusions which the experimenters have drawn from the tests are those relating to the length of the tubes. They conclude that for the most practical efficiency the tubes should not be less than 13 feet, nor more than 16.5 feet in length, and that there should be as many tubes as the tube sheet will hold with a proper distance between them in the plate. The conclusion is also reached that tubes with interior wings (*ailettes*) like the Serve tube, give better efficiency than the plain tube of the same length. Among the other conclusions of interest is the one about arches in the firebox. The short brick arch seems to have been the one that, on the whole, gave the most satisfactory results.

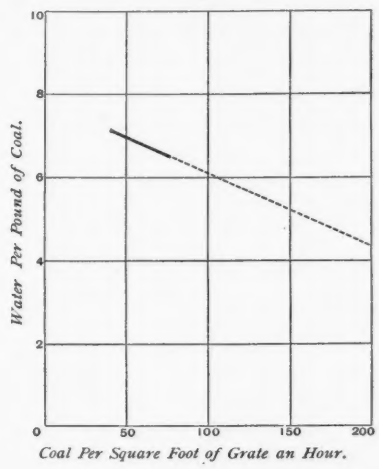
In reading the accounts of these tests it is imperative to remember that their value from the standpoint of American locomotive practice is limited by the low rate of combustion per square foot of grate. What the experimenters have thought to be a very high rate, and have used as a maximum, is less than one-half of the maximum rate used here. What would have been the results if the rate had been as high as it is here cannot be estimated with satisfactory exactness. It is clear, though, that the best length of tubes would not be more, for when the blast is stronger, and there is a higher rate of combustion, there is more reason for using a short tube so as to reduce the friction of the air and gases.

It is noticeable that all of the common theories of the action of the fire in a locomotive firebox correspond with the results of these experiments, and this fact makes these tests of real value to engineers in this country, and they are of further use, as they have given some facts not before known. It is to be regretted that the conclusions have to be limited by the small range of draft, between which the tests were made. The range of smoke box vacuum was from 1.0 inch to 2.95 inches. Now, the range in this country is from 1.0 inch to 14 or 16 inches in extreme cases. The greater the draft the more coal will be used on the grates; here we use from 50 to 190 lbs. of coal an hour per sq. ft. of grate, while these tests had only a range from about 20 to 70.

The conclusion that a 13-foot tube is the most practical answers very well for the small draft used in the experiment, but when the draft is fully twice as great as is the case here, the conclusion may not be a proper one. Here, as in France, the first thing sought is a high maximum capacity of the boiler, for the trains must be hauled. The results showed that when the tubes were made long the friction of the gases in the tubes was so great that the power was much reduced, the draft not being sufficient to blow the fires. This is what led to the conclusion that 13 feet is the best length of tube for the conditions in France, although the longer tubes gave a better economy. It was found that 23-foot tubes were more economical than shorter ones, but the capacity was so much reduced that 13 feet was selected as the most practical length.

All this conviction about the length was based on tests with 2-inch tubes; if the tubes had been increased to 3 inches the conclusion might have been different, and the best length would probably have been more. Equally true is it that if the capacity of the boiler had been made greater to meet the demands of service, and the draft increased to gain this, the most practical length would have been found to be shorter, and, perhaps, not more than 10 feet.

It is in this way that the results of these tests are limited when applied to American practice, yet they do show some things of real value, and not the least is the fact that we need larger grates and more heating surface, if we can get it. The small diagram shows this fact more plainly than words can describe.




The range of the experiments is within the heavy full line, and the range of American practice is within the dotted line. The slope of the line shows how the efficiency of the boiler decreases as the draft is increased, and more coal is burned per sq. ft. of grate an hour. It is not to be expected that in this country we can get as great efficiency as was obtained in the tests with the less draft. The forcing here can only be reduced by adding to the grate area, as no one need expect to have the weight of trains reduced. Trains will increase in length and weight until a limit is reached, but where that limit will be found it is impossible now to tell. The use of steam at the present rate, or at a higher rate, must be expected, and that means rapid combustion on the grates, and a very strong draft.

So long as the fires are blown by the exhaust, care must be taken not to reduce too much the power of the cylinders by the back pressure therein, as that would defeat the fundamental purpose of increasing the efficiency. Now, as the draft cannot be increased beyond what it is on some of the best designs of engines here, it is evident that the length of the tubes cannot be increased much, unless the diameter is also increased so as to reduce the friction of the gases. This almost confines the increase of heating surface to an increase in the number of tubes, and to an increase of the area of the fire box sheets. The number of tubes of a given diameter is dependent almost wholly on the diameter of the boiler. The diameter of the boiler determines very largely the weight; the weight of most of the other parts being so nearly fixed by what has been found to be good practice, that the variations produced by changes in small parts is of little importance in comparison with the effect of the boiler on the total weight. So then, whatever we do to increase the heating surface must be done without much increase of the total weight, as that is now as great in the newest types as will probably be permitted per wheel for some time to come. This weight has reached 23,000 lbs., and track engineers begin to be scared and want to call a halt until they see what is the effect of this wheel load.

The diameters of the boilers for eight wheel engines have been increased nearly to the limit on the latest designs, and there is little hope for more tubes in the future, at least not for enough more to give any great increase in the capacity or the efficiency of the boiler. Engines that formerly had 54-inch boilers now have 60-inch; this is an increase of 15 per cent. Some have 64-inch boilers, and this is an increase of 30 per cent., probably then, for the present, the diameter will not be increased much, and the number of tubes will not be greater, especially in view of the fact that some roads are putting the tubes farther apart, so as to increase the life of the tubes, which is much affected by the scale that is deposited when the water is bad. From this it would appear that whatever increase we are to get in capacity and efficiency must come from an improved combustion on the grates, and this can be done by increasing the area of the grate.

Bearing on this point is the present agitation of the question of how to stop the bulging of the side sheets. If the bulging should be found to occur in fireboxes where the grates are large, then there is not much hope of reducing it by increasing the grate area, and thus decreasing the temperature of the fire. But it is generally reported that bulging only occurs in fireboxes having small grates, that is, not more than 40 sq. ft. One fact that argues well for increasing the grate area, is that with care in design an increase of grate does not require an increase of the total weight.

To sum up what these French experiments show, most important of all is the clear illustration of the value of as large a grate as can be properly fired. Next in order of importance is the economy that may be expected from a brick arch when the blast is strong. Least important is the limitation that must be placed on the length of the tubes.

In this country the work should be taken up for the American conditions and with the draft increased so that we may learn just what are the limits of best practice under our conditions. This is the sort of work for the shop test committee to take up, and it may be that one set of tests of real value by that committee would bring out all the money that is needed for the remainder.

Those who are intersted in the saving of fuel on locomotives will find the discussion at the last meeting of the Western Railway Club suggestive, as it shows how little really earnest attention is given to the matter on most roads, and how meager and inadequate is the interest that the higher officers take in plans for reducing the fuel per ton-mile. It would seem that on some roads the subject of fuel saving is avoided by all as a very unpleasant topic, and that the few dollars spent for the wages of men to travel on the engines and instruct the firemen, and for a few clerks to keep an account of the details of the expenditure of one to two millions of dollars annually for fuel, were considered as good as wasted. The other side of this matter is that those who handle engines, and those who know of the waste of fuel caused by the conditions carelessly imposed by some operating officers, also know that it is a poor fuel clerk and a lazy traveling fireman or engineer who cannot save ten times his wages for a year in the first month after his department is put fully on its feet.

## December Accidents.

Our record of train accidents in December, given in this number, includes 66 collisions, 69 derailments and 7 other accidents, a total of 142 accidents, in which 29 persons were killed and 90 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

| COLLISIONS: | Rear. | Butting. | Crossing and other. | Total. |
|---|---|---|---|---|
| Trains breaking in two | 9 | 0 | 0 | 9 |
| Misplaced switch | 5 | 1 | 0 | 6 |
| Failure to give or observe signal | 4 | 0 | 1 | 5 |
| Mistake in giving or understanding orders | 0 | 1 | 0 | 1 |
| Miscellaneous | 10 | 2 | 9 | 21 |
| Unexplained | 10 | 4 | 10 | 24 |
| Total | 38 | 8 | 20 | 66 |

| DERAILMENTS: | | | |
|---|---|---|---|
| Broken rail | 8 | Loose wheel | 1 |
| Loose or spread rail | 3 | Misplaced switch | 2 |
| Defective bridge | 3 | Derailing switch | 1 |
| Defective switch | 1 | Animals on track | 2 |
| Bad track | 1 | Landslide | 3 |
| Broken wheel | 3 | Snow or ice | 6 |
| Broken axle | 3 | Accidental obstruction | 2 |
| Broken truck | 1 | Unexplained | 27 |
| Fallen brakebeam | 1 | | |
| Failure of drawbar | 1 | Total | 69 |

| OTHER ACCIDENTS: | |
|---|---|
| Broken side rod | 1 |
| Cars burned while running | 5 |
| Loose door | 1 |
| | 7 |
| Total number of accidents | 142 |

A general classification shows:

| | Collisions. | Derailments. | Other ac'd'ts. | Total. | p.c. |
|---|---|---|---|---|---|
| Defects of road | 0 | 16 | 0 | 16 | 11 |
| Defects of equipment | 9 | 10 | 2 | 21 | 15 |
| Negligence in operating | 33 | 3 | 5 | 41 | 29 |
| Unforeseen obstructions | 0 | 13 | 0 | 13 | 9 |
| Unexplained | 24 | 27 | 0 | 51 | 36 |
| Total | 66 | 69 | 7 | 142 | 100 |

The number of trains involved is as follows:

| | Collisions. | Derailments. | Other ac'd'ts. | Total. |
|---|---|---|---|---|
| Passenger | 24 | 30 | 4 | 58 |
| Freight and other | 95 | 39 | 3 | 137 |
| Total | 119 | 69 | 7 | 195 |

The casualties may be divided as follows:

| KILLED: | Collisions. | Derailments. | Other ac'd'ts. | Total. |
|---|---|---|---|---|
| Employees | 13 | 11 | 0 | 24 |
| Passengers | 2 | 0 | 0 | 2 |
| Others | 2 | 1 | 0 | 3 |
| Total | 17 | 12 | 0 | 29 |
| INJURED: | | | | |
| Employees | 36 | 21 | 1 | 58 |
| Passengers | 20 | 10 | 0 | 30 |
| Others | 0 | 2 | 0 | 2 |
| Total | 56 | 33 | 1 | 90 |

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

| | Pass. Killed. | Pass. Injured. | Emp. Killed. | Emp. Injured. |
|---|---|---|---|---|
| Defects of road | 0 | 4 | 4 | 6 |
| Defects of equipment | 0 | 0 | 0 | 1 |
| Negligence in operating | 2 | 20 | 14 | 36 |
| Unforeseen obstructions and maliciousness | 0 | 0 | 2 | 2 |
| Unexplained | 0 | 6 | 4 | 13 |
| Total | 2 | 30 | 24 | 58 |

Twenty-three accidents caused the death of one or more persons each, and 21 caused injury, but not death, leaving 98 (69 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with December of the previous five years shows:

| | 1894. | 1893. | 1892. | 1891. | 1890. | 1889 |
|---|---|---|---|---|---|---|
| Collisions | 66 | 84 | 107 | 125 | 82 | 90 |
| Derailments | 69 | 77 | 95 | 101 | 111 | 67 |
| Other accidents | 7 | 5 | 10 | 8 | 14 | 11 |
| Total accidents | 142 | 166 | 212 | 234 | 207 | 168 |
| Employees killed | 24 | 24 | 37 | 62 | 35 | 44 |
| Others killed | 5 | 7 | 4 | 23 | 18 | 8 |
| Employees injured | 58 | 89 | 110 | 172 | 104 | 122 |
| Others injured | 32 | 120 | 119 | 159 | 79 | 52 |
| Passenger trains involved | 58 | 64 | 84 | 72 | 80 | 59 |
| Average per day: | | | | | | |
| Accidents | 4.58 | 5.36 | 6.84 | 7.55 | 6.68 | 5.42 |
| Killed | 0.94 | 1.00 | 1.32 | 2.74 | 1.71 | 1.68 |
| Injured | 2.90 | 6.74 | 7.39 | 10.68 | 5.90 | 5.61 |
| Average per accident: | | | | | | |
| Killed | 0.204 | 0.187 | 0.193 | 0.363 | 0.256 | 0.309 |
| Injured | 0.634 | 1.259 | 1.080 | 0.415 | 0.884 | 1.036 |

The number of passenger train accidents of the worst class was quite small in December. The crossing collision at Waxahachie, Tex., in which two passengers were fatally injured, was the worst one. We have no information concerning its cause beyond that stated in our note of January 11. The collision at Altoona, Dec. 24, appears to have been in no way due to "a failure of block working."

The collision at Plainsville, Pa., on the 18th, is said to have been quite costly, though only a few persons were injured. The derailment near Washington, D. C., on the 3d, is a reminder of the risk involved in running locomotives at high speed with the tender foremost. The derailment near Wells, Me., on the 10th, is said to have been less disastrous than it might have been, by reason of the quick action of State Railroad Commissioner Chadbourne, who was in the drawing room car, sitting nearly over the axle which broke. The conductor started to pull the conductor's valve and apply the brakes, but Mr. Chadbourne told him to pull the bell and let the engineer make a moderate stop. This was done and no great damage resulted from the derailment.

Of the fires in cars noted this month three were on passenger trains, and one was in an officer's car, which was destroyed, with all its contents, the occupants having none too much time to escape with their lives. Fires in passenger cars standing at stations and in yards have been reported from a good many places this winter.

Near New Haven, Conn., on the 16th, an engineman was badly injured by jumping off when he saw a train ahead which he expected to run into. The train proved to be on another track. Near New Florence, Pa., the fireman of a passenger train was blown off the engine by a high wind and was killed.

Street cars furnished a considerable variety of items for the accident list in December. At Oakland, Cal., on the 4th, a cable car was struck by a passenger train, and one of its occupants was killed. An electric car was wrecked at Birmingham, Ala., on the 12th in a similar manner. At Los Angeles, on the 23d, a passenger in an electric car was killed by the same kind of an accident, and at Carthage, Mo., on the 28th, a horse car driver drove so fast down a hill that he ran his car into a freight train, injuring several of his passengers.

There was a bad collision of cable cars in the Washington street tunnel at Chicago on the 11th, two passengers being killed and 20 injured. This case was reported in the *Railroad Gazette* Dec. 21. On the 29th an electric street car at Oakland, Cal., ran into an open draw, and the two men upon it went down into the water, but they got out without serious injury. This accident was at the Webster street bridge, which has come to have a familiar sound in connection with drawbridge accidents. In Philadelphia, on the 7th, there were two street car collisions injuring two persons, and on the 25th two others were hurt in the same city from a similar cause. Seven were hurt in the same way in Brooklyn, N. Y., on the 1st, and two at Scranton, Pa., on the 30th. Two or more persons in carriages were killed on grade crossings at Jamestown, N. Y., on the 7th; Binghamton, N. Y., on the 9th; Bridgeport, Conn., on the 18th, Vineland, N. J., on the 23d; Green Bay, Wis., on the 25th, and Chicago on the 30th.

## Annual Reports.

*Philadelphia & Reading.*—This company reports for the year ending Nov. 30, 1894. The general results are as below:

| | 1894. | 1893. | Dec. per ct. |
|---|---|---|---|
| Gross earnings | $20,344,775 | $22,828,845 | 10.9 |
| Working expenses | 11,278,989 | 13,369,424 | 15.7 |
| Net earnings | $9,065,786 | $9,459,421 | 6.1 |
| Net from other sources | 505,633 | 609,072 | |
| Net from Coal & Iron Co. | 268,553 | 1,104,196 | |
| Total net | $9,839,972 | $11,172,689 | 12.0 |
| Rentals, interest &c. | 11,772,979 | 11,975,032 | |
| Deficit (two Companies) | 1,933,007 | 802,343 | |

The interest on the general mortgage loan, amounting to $1,784,607 is included in the fixed charges and comparing this with the deficit of the two companies it is seen that the earnings fell short by $148,399 of an amount sufficient to pay the charges ahead of the general mortgage interest. But taking into account the probable necessary expenditures for maintaining the physical conditions of the properties, the aggregate deficiency in meeting the fixed charges of both companies is about $1,375,769. It is believed that about one million dollars a year should be provided for new equipment, for air brakes and automatic couplers and for improvements in the line, yard, wharves and station.

The greatest falling off in traffic revenue is from coal where the decrease in receipts is $1,543,553. This is partly from a decline in the tonnage of nearly 334,000 tons and partly from lower rates. The passenger traffic fell off $211,172, partly from the depression in business and partly, the report says, from the competition of the electric railroads about Philadelphia. Merchandise receipts show a very serious decline: namely, nearly $730,000.

The equipment has been fairly well kept up, particularly in locomotives and passenger and coal cars. The freight cars have not been so well kept up, the lessened business not requiring them in service. The track will require somewhat larger expenditures than have been made in the last two years. A new coal storage plant at Port Richmond has been contracted for, which will cost about $160,000 and will be in operation in the spring of 1895, and will, it is estimated, handle coal at a cost of five cents a ton and will pay for itself in about five years.

*Lehigh Valley.*—This company reports for the year ending Nov. 30. The miles operated were 1,921, being 18 miles more than in the year preceding. The principal results of operation are as below:

| | 1894. | 1893. | Inc. or Dec. per cent. | |
|---|---|---|---|---|
| Gross earnings | $17,330,594 | $18,610,777 | D | 7.0 |
| Working expenses | 13,320,829 | 12,705,360 | I | 5.0 |
| Net earnings | $4,009,765 | $5,905,417 | D | 32.2 |
| Miscellaneous receipts | 1,036,053 | 363,233 | | |
| Total net | $5,045,818 | $6,268,650 | D | 19.6 |
| Interest, fixed charges and dividends | 4,918 748 | 5,744,263 | | |

No dividends were paid in 1894, but in 1893 $1,016,342, or four per cent. dividend was paid. The earnings from coal fell off about $824,000. From miscellaneous freight the decline was only about $27,000; from passengers, the loss was $502,000. The total tonnage declined about 4 per cent., but the ton-miles increased over 5 per cent. The ton-miles rate on coal was 0.732 cent as against 0.823 the year before. On the total tonnage the average rate was 0.668 as compared with 0.744 the year before. The passenger-miles fell from 131 million to 103 million, but the average passenger rate increased from 1.994 to 2.52 cents. This change in the passenger business is significant. The loss of long distance passenger travel as compared with the World's Fair year is said to have been offset in a large measure by the increase in through passenger business from the Seaboard to the West. At any rate the average journey increased from 20.45 miles in 1893 to 21.32 The most important factor in the change in passenger business is probably the opening of electric railroads between many of the largest towns situated on the system, which has taken away the short distance and low fare traffic.

A contract has been made with the Delaware, Susquehanna & Schuylkill Railroad, giving that company traffic rights for its coal to New York by water, for 15 years, assuring an important traffic. The contract by which loaded cars are delivered on floats to the New York, New Haven & Hartford Railroad is said to have opened up a large traffic, particularly in coal and Western agricultural products. The interchange of business under this arrangement has increased to such volume that it has been found necessary to provide two additional bridges at the Jersey City terminal for the transfer of cars to the floats.

During the year 2,000 coal cars of 60,000 lbs. capacity were contracted for and their delivery is nearly completed. The ownership of these cars is vested in the Lehigh Valley Terminal Railway Co. under a car trust. Out of 51,030 coal and freight cars of the company 13,177 are fitted with M. C. B. couplers and 8,296 with air brakes. The policy has been adopted of abandoning 4-wheel coal cars which require large repairs, and 1,824 of these cars have been broken up, being replaced by the new 8-wheel cars. This substitution has given an increase of 37,796 tons in coal-car capacity.

The double tracking of the Mountain cut off has been completed and the main line has now a continuous double track from the Hudson River at Jersey City to Buffalo, a distance of 488 miles. The 45 ft., miter-joint rail has proved so satisfactory that it has been adopted as standard.

Work on the pier and storage plant at West Superior has been pushed, and it will be ready for operation on the opening of lake navigation. This will give the Lehigh Valley Coal Company great facilities for delivering coal to the railroads of the Northwest. Furthermore, property for a water front yard has been secured in South Chicago, and this it is proposed to improve at once for next year's business.

*Certain Chicago Street Railroads.*—The reports of the Chicago city railroads are especially interesting now in view of the efforts that are being made to improve the condition of the elevated roads there. On January 8 were held the annual meetings of the stockholders of the North Chicago Street Railway Company, the West Chicago Street Railway Company, and the Lake Street Elevated. Of the three roads, the North Chicago alone earned its regular yearly dividend of 12 per cent., and had a surplus. The West Chicago failed to earn its 9 per cent. dividend, and was compelled to draw in its surplus to make up the balance. The Lake Street Elevated failed to earn even the interest on its bonds. The following are the detailed reports for the year:

*North Chicago Street Railway Co.*

| | |
|---|---|
| Receipts:— | |
| Passengers | $2,479,813 |
| Other Sources | 85,805 |
| | $2,565,618 |
| Expenses:— | |
| Operating | $1,347,326 |
| Interest, Insurance, etc | 465,648 |
| | $1,812,974 |
| Net Earnings | $752,644 |
| Dividend, 12 per cent | 659.913 |
| Surplus | $92 731 |
| Balance to Surplus Account, 1894 | $1,264,345 |
| Balance to Surplus Account, 1895 | $1 357,076 |
| Total Passengers carried | 49,571,483 |

The net earnings fell 7 per cent. below 1893 and 2 per cent. below 1892. The cost of operating the property was 54.33 per cent. of the gross receipts.

*West Chicago Street Railway Co.*

| | | |
|---|---|---|
| Receipts:— | | |
| Passengers | | $4,142,453 |
| Other sources | | 38.784 |
| | | $4,181,237 |
| Expenses:— | | |
| Operating | $2.518.628 | |
| Interest, Insurance, etc | 859,470 | |
| | | $3,378,098 |
| Net Earnings | | $803,139 |
| Dividends paid | | 184,298 |
| Deficit | | $ 381,159 |
| Total passengers carried | | 85,287,302 |
| Receipts per car mile, horse car branch lines. | | 0.2340 |
| " " " cable cars | | 0.3007 |
| Expenses per car mile for horse cars | | 0.1838 |
| " " " cable cars | | 0.1346 |

The total number of passengers carried for 1892 was 94,518,474, and 1893, 107,053,461, which shows a decrease for 1894 of 9,231,172 less than 1892, and 21,766,159 less than 1893. Of course the figures cannot be compared with 1893 on account of the extraordinary condition of 1893.

Electric power is being substituted for horse power on branch lines, which will cheapen the operating expenses considerably. The competition of the Metropolitan Elevated will, however, be felt in the coming year, and i is quite uncertain as to the earning of the 9 per cent dividend.

*Lake Street Elevated.*

| | |
|---|---|
| Net Receipts for 10 months | $138,005 |
| Interest on bonds | 284,730 |
| Deficit | $146,725 |

The average number of passengers carried daily is only 27,135, while in order to pay operating expenses and fixed charges it would have to average 50,000.

*Chicago City Railway Co.*

The annual report of the Chicago City Railway Company to the stockholders was made January 15, and shows a considerable falling off in the earnings. Only 13.53 per cent. was earned, against 27 per cent. 1893, 19.01 in 1892 and 17.27 in 1891. The following are the essential features of the report:

| | |
|---|---|
| Receipts:— | |
| Passenger earnings | $4,239,749 |
| Other sources | 24,869 |
| Total | $4,264,618 |
| Expenses:— | |
| Operating expenses, | |
| Insurance and taxes | $2,838,684 |
| Interest on bonds | 207,878 |
| Total | $3,046.562 |
| Net earnings, 13.53 per cent | $1,218.057 |
| Dividends, 12 per cent | 1,080,000 |
| Balance to surplus account | $138,057 |
| Number of passengers carried | 84,794,987 |
| Car miles for cable cars | 15,231 400 |
| " " horse cars | 3,965.750 |
| " " electric cars | 1,820,260 |
| Total | 21,047,410 |
| Operating expenses per car mile for cable cars | $0.0997 |
| " " " " horse " | .2539 |
| " " " " electric cars | .1690 |

One of the most surprising features of this report was the high cost of operating the electric and horse-car lines. The West Chicago Company made a better showing on the horse-car lines, but did not do as well on the cable as can be seen by a comparison of the reports.

## The Pooling Bill.

The Senate Committee voted on Tuesday of this week to report the Patterson bill to the Senate as it came from the House, without amendment, but several members of the committee submitted to the rejection of their amendments under protest, and state that they will bring them up in the open Senate. Senator Sherman's proposal to amend the bill by tacking on a section regulating sleeping car fares seems to have been rejected by the committee without much ceremony. It remains to be seen whether the Senator will press his amendment when the bill comes up in the Senate. Mr. Morrison's proposed amendment was also rejected, but only by a tie vote. The substance of his proposals was that the commission might, before approving a pooling contract, not only "inspect it," as provided in the Patterson bill, but make such "investigation and consideration" as might be deemed proper; and that the commission should disapprove a pool whenever it should be of opinion that it would work injustice "for want of necessary restrictions and limitations."

The first of these proposals would leave the way open for the Commission to take up almost any question concerning rates on railroad, whenever a pool should be presented by that road. This would, of course, be strenu-

ously objected to by any member of Congress who believes in the rightfulness of unrestricted pooling. Undoubtedly many members do thus believe. While the rule probably would not work much harm in practice. its effect could only be mischievous, for it is the duty of the Commission to investigate and give publicity to any important abuse in connection with rates on any road, without waiting to make some action by the road an excuse for moving in the matter. Mr. Morrison's second idea evidently contemplates the incorporation in pooling contracts of an agreement not to raise rates; but here, again, he adopts a roundabout, and probably ineffective means to accomplish an end which may or may not be desirable. Even if it should be right in any given case for the Commission to exact some promise about rates before approving a pool, the promise should not be incorporated in the pool. A pool might last and be perfectly successful for a year, or five years, where the rates might need changing every six months.

The fortunes of this bill are still beclouded, and not till it is taken up in the Senate, which has not been done as we go to press, will its fate be known. Press despatches of Tuesday night say:

Since the bill reached the Senate there has been a great pressure to defeat it, and equally as much to secure a report of the measure without amendment, for the reason that its friends feared any change in the text of the bill as it passed the House would imperil it if again sent back to that body. Its opponents, mindful of this weakness in the position of the bill, sought by every means to accomplish its amendment. The vote on all amendments was the same—5 to 5—and all were lost. Those who voted to amend the bill were Messrs. Gorman, Smith, Chandler, Wilson and Lindsay. Those who voted for the measure just as it came from the House were Messrs. Brice, Camden, Wolcott, Butler and Higgins.

It appears that the petty political quarrels of Congressmen have influenced some of the opposition to the bill, and some not very level-headed Senators have just found out that they wish to offer various amendments. Besides all these hindrances, we are rapidly drifting toward the close of the session, when the very perplexing currency question is liable to overshadow everything else.

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The latest folder of the Atlantic Coast Line is made on a somewhat novel plan. It consists of six maps, each filling an ordinary folder page and each showing the routes traversed by the sleeping cars of a particular train. The six pages therefore furnish a guide to the through cars on the three south bound and three north bound through trains over the Atlantic Coast Line between New York and Florida. The general principle of the map is somewhat like that of the "common sense time-table" issued by the Burlington road in 1892, but there is no time-table or list of stations arranged in columns after the usual fashion, nothing but a map with the names of the places at which the through trains stop, and under each name the time at that place of the train to which the map refers. The route of the sleeping cars is shown by a heavy red line, and the roads over which the principal connecting trains run are shown in heavy black lines. No side lines or connections are shown, except to these few principal points. For example, the map for train No. 35 leaving New York at 9 A. M., with four sleeping cars, shows a red line through to Port Tampa and branch red lines to Macon, Thomasville and St. Augustine. Branch black lines are shown to Norfolk, Wilmington, Columbia, Brunswick and Palm Beach. The map for the New York and Florida special shows a single red line from New York to St. Augustine, all the branches being black. This map makes a very intelligible presentation of the information desired. The others are slightly less satisfactory, as where the trip of a sleeping car is partly on the main line and partly on a branch it is necessary to refer to the text at the foot of the map to learn full particulars. On the whole the folder is an interesting experiment, and we hope that the times and runs of the cars will not be changed often enough to make the cost of new map plates too heavy. The ordinary time table is a puzzle to the inxeperienced traveler, and often so much condensed as to exasperate the experienced. On the other hand, the convenient and clear tables, printed in large type and with room enough to show every train in its proper place, which some roads issue for their best trains and a few roads for all trains, seem to be too costly to come into such general use that the public may get familiar with their stye. The golden mean, not so expensive but that all roads can afford to adopt it and circulate copies freely, seems to be yet in the future.

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A friendly suit has been begun in the Supreme Court at Albany, N. Y., to test the new constitutional prohibition of free passes as applied to notaries public. The suit is brought by the Attorney General against William F. Rathbun, an attorney for the Delaware & Hudson Canal Company, who rode on a pass between Cohoes and Albany on January 2. If Mr. Rathbun should be found guilty of a misdemeanor, and be put in jail, he would probably regard the suit as anything but "friendly," and would wish that he had stayed in Cohoes.

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The Connecticut Legislature passed a law, last Tuesday, that no electric, cable or horse railroad shall hereafter be constructed across the tracks of any steam railroad at grade; and no steam railroad shall hereafter be constructed across the tracks of any electric, cable or horse railroad at grade. It went into effect at once, and the proposed electric road across the New York, New Haven & Hartford, at Bridgeport, would seem to have been effectually stopped, the New Haven company having succeeded, by injunction, in staving off action until after this bill was passed.

## TECHNICAL.

### Manufacturing and Business.

The Lapham Brake-Shoe Co., of Bloomfield, N. J., has elected the following officers: President, Thomas Milburn; Vice-President, Leroy W. Baldwin; Secretary and Treasurer, W. De Hart; Directors, A. B. Rogers, Henry E. Bowers, Joseph D. Gallagher, W. De Hart, L. W. Baldwin, Harry G. Darwin, and Thomas Milburn.

The Taylor Hydraulic Air Compressing Co., with a capital of $500,000, is applying for a charter from the Dominion Government, with headquarters at Montreal.

Mr. Frederick F. Culver, General Manager of the Unadilla Valley Railroad, 80 Broadway, New York City, reports that the company is in the market for two turntables.

The Bethlehem Iron Co. will erect four 40-ton basic open-hearth furnaces and nine soaking-pit furnaces. A large universal mill will also be erected for them by Mackintosh, Hemphill & Co., of Pittsburg.

The Block-Pollak Iron Co., of Cincinnati, O., and Chicago, has purchased the Richland Railroad, of Nashville, Tenn., seven miles in length. This road was laid with 46-lb. rails, which are for sale, together with the rolling stock, consisting of 4 dummy engines (Baldwin make) and eight passenger cars (open and closed). It is the intention of the Block-Pollak Co. to rebuild the road as an electric road in its place.

The Ballasting Plant Company has been formed in London to manufacture under the patents of Mr. T. Rodgers and others the ballast trucks and "plow spreaders" for ballasting railroad track. The capital of the company is to be £7,500, issued in £1 shares. The cars have been used for some time on the Great Western Railway of England. They are very familiar in America, and have a good record for their work on railroads in this country. They were illustrated in the *Railroad Gazette* of Jan. 12, 1894.

The Dressel Railway Lamp Works, of New York City, has secured a charter in New York to manufacture and sell railroad and marine signal lamps and lanterns and railroad supplies. George C. Dressel, Frederick W. Dressel, of New York City, and Charles H. Dressel, of Mount Vernon, are the directors.

A company called the DeKalb Railroad Car Ventilation Co. has been organized to make the DeKalb ventilating car window and introduce it in the railroad field. The window will be made under the patents of Mr. C. E. DeKalb, of Syracuse, N. Y. It was very fully illustrated and described in the *Railroad Gazette* of March 2, 1894. The officers of the new company are Isaac B. Newcombe, President; W. W. Newcomb, Secretary, and General Superintendent, E. E. DeKalb, of Syracuse. These are the directors with Frank McAuliffe. The main office of the company will be at 35 Wall street, New York City.

The Acme Metal Co., of Chicago has combined the manufacture of its well known Acme anti-friction Babbitt metals with the Thayer car journal bearings, which are well and favorably known for their superior qualities. The company has recently established an agency in New England under the management of Mr. A. W. Young, with an office at 152 Federal street, Boston.

The Standard Paint Co., of 2 Liberty street, New York, received the order for insulating paper for the Merchants' Despatch Transportation Company's new refrigerator cars as noted in this column last week. The order for this material, however, is much larger than was made to appear. The Standard Paint Co., received an order for 414,600 sq. ft. of 2½ ply Giant P. & B. paper for each of the two car companies building the 300 cars ordered by the Merchants' Despatch. The Standard Paint Co. has also orders for considerable repair work for the Merchants' Despatch, and altogether the orders from that company amount to about 1,000,000 sq. ft. of "P. & B." insulating paper.

The Youngstown Bridge Co. has been awarded the contract for a six span bridge at Clarksville, Ark.; a bar mill building for the Ohio Steel Co.; a mill building 85 ft. x 200 ft. in New York; and the South street bridge at Warren, Ohio, consisting of three 70 ft. girder spans.

The *Boston Herald* recently published a short history of each of the several firms in Boston which have passed through 50 years or more of active business life. The only one mentioned as dealing in railroad supplies is the Boston Belting Co. The manufacture of rubber was first introduced in Roxbury (now a part of Boston) in 1828 by the Roxbury Rubber Co. In 1844 Mr. Charles Goodyear, whose name has long been identified with the rubber business, secured the controlling interest in the firm and the name of the company was changed to the Goodyear Mfg. Co. This was again changed in the following year to the Boston Belting Co. That company continues to retain the exclusive right to manufacture all kinds of mechanical goods, such as belting, hose, packing, springs, valves, etc. The business of the Boston Belting Company steadily increased, the factory buildings cover about three acres of land, and employment is given to more than 500 men. The company now has a paid up capital of $1,000,000, with a surplus of about $600,000. The principal store and office is at 256 Devonshire street, Boston, with a branch store at 100 Chambers street, New York city. The directors and officers of the company are: W. S. Eaton, James Bennett Forsyth, James Pierce, George A. Miner, George Whitney, George H. Forsyth and J. H. D. Smith. The officers are: President, W. S. Eaton; Manufacturing Agent and General Manager, James Bennett Forsyth; Treasurer, J. H. D. Smith.

The Niles Tool Works Co., of Hamilton, O., has recently received an important order for tools from France, which will be interesting and gratifying to all friends of the company and those concerned in the growth of the demand for tools of American manufacture for export. The order is from the Arbel Company, of France, manufacturers of the well-known Arbel wrought-iron wheels whose handsome exhibits at the World' Fair will be remembered. This firm is making an extensive enlargement of its plant at Douai, France, and the order is for all the machine tools to be used in this plant. It will include heavy geared slotters, lathes, boring mills, hydrostatic presses, special axle lathe, etc. These machines will be driven by electric motor, and the plant, we understand, is to be so arranged that there will be no overhead belting or line shafting.

### Iron and Steel.

A meeting of the stockholders of the Birmingham Rolling Mills Co. was held a few days ago, and then it was voted to increase the capital stock from $500,000 to $800,000 and to erect a steel mill. Machinery for this plant has been contracted for in Pittsburg.

The South steel mill of the Lackawanna Iron & Steel Co., at Scranton, Pa., resumed operations Jan. 16, on double turn, employing 700 men. The North steel mill also started up on double turn last week with 1,500 men at work.

The Bessemer Land & Improvement Co. has purchased the steel plant at Fort Payne, Ala., which will be torn down and moved to Bessemer. The question of the manufacture of steel in the Birmingham district has been agitated for several years, but this is the first move in the direction.

### New Stations and Shops.

The Cleveland, Cincinnati, Chicago & St. Louis has decided upon the location for its new and extensive shops at Wabash, Ind., which are to replace the shops burned last October. Plans for the new buildings are now being made, and the officers expect to commence work early in the spring. The shops will be much larger than the old plant, and built on entirely different plans.

The Western Maryland has decided to build a handsome new station at the intersection of its line with West North Avenue, Baltimore. A site about 100 ft. x 230 ft. has been purchased. The new station will obviate the necessity of hauling passengers through the Pennsylvania tunnel.

The Cotton States and International Exposition Company intend to build in the grounds a decorative concrete arch 150 ft. long. Plans from Mr. Fr. von Emperger, New York, are under consideration.

The Pittsburg, Wheeling & Kentucky, operated by the Pittsburg, Cincinnati, St. Louis & Chicago, has let the contract for a new passenger station and office building at Wheeling, W. Va. The successful bidders were John W. Beltz, Son & Co., of Wheeling, W. Va., for the superstructure, furniture, etc., and Hallock Bros., of Wheeling, for the stone work. The prices are not made public, but the structure will cost approximately $50,000. The building will be three stories high on the east side, facing the Ohio River, and two stories on the west, facing the end of Eleventh street. The plans were made by Chief Engineer Becker, of Pittsburg. The building will be of pressed brick, with ornamental stonework. The first story will be used for express, baggage, and storage rooms, and the second, on the level of Eleventh street, for passenger waiting-rooms and ticket offices. The third story will accomodate the general offices. The waiting-rooms will be 25 ft. x 35 ft., and 30 ft. x 35 ft., with ticket offices between. There will be train sheds 300 ft. long, covered with the projecting roof of the building, and stands for hacks, express wagons, etc. A stone retaining wall, 200 ft. in length, will be built along the river bank, and the space filled in for the switches and sidings. The station is to be completed by July.

### The Nicaragua Canal.

The latest news that we have of the Nicaragua Canal bill in the United States Senate is that its friends hoped to get a vote on this day, Friday. This, however, seems to be contingent on other affairs, and perhaps the final test will not come too soon.

### Interchange of Cars.

A Committee of the Master Car Builders' Association sends out this circular: There has been a tendency for the past few years in the deliberations at the Master Car Builders' Conventions, and in the actions of these conventions, to put upon car owners, in the rules of interchange, more and more responsibility for defects in freight cars, and it is now the intention of the committee to see whether the matter cannot be put in such shape as will decrease not only the cost for repairs to the railroads of the country, but will also eliminate the serious detentions to cars which occur at all interchange points.

The idea is to have cars pass from one road to another if in safe condition for movement, and that the inspection in so far as stopping cars at junction points is concerned, shall be made simply for safety. It should be considered that the railroads, when moving foreign cars, are paying to their owners, for their use, a sum, in a general way, adequate to cover all natural wear and tear and replacement of equipment destroyed and worn out; so that, in a general way, the owners of cars are paid for

the cost of repairs necessary by foreign mileage of their cars. It is probably time that the selfish view, as acted upon at interchange points in endeavoring to make the connecting lines stand all expense possible in repairs of cars which may be offered for movement, should be considered as no longer serving the individual interest of railroad companies.

It is desired to have a full expression of opinion, especially in connection with the questions following:

First. How many men do you employ as car inspectors, whose service could probably be dispensed with if the inspection were made for safety only, instead of being made for protection also, as is now necessary under the rules of interchange?

Second. Are you in favor of owners being held responsible for the condition of cars except in case of accident or casualty, no repair to be made except by owners, unless the car is in unsafe condition to run?

Third. If so, have you any suggestions to offer as to what shall be considered prima facie evidence of unfair usage?

Fourth. If this rule were adopted, would you restrict its application to roads owning a certain number of cars per hundred miles operated? If so, what would be your recommendations?

Fifth. If not in favor of an absolute responsibility of owners, are you in favor of increasing the number of parts included in rule number eight? If so, please enumerate parts; and, if necessary, conditions.

Sixth. If you would recommend a greater number of parts for which owners are responsible, than those for which they are not, would you recommend changing the rule to read: "Owners will be responsible for all defects developing under fair usage, except" (giving exceptions you would recommend)?

Seventh. If, in your opinion, these questions do not cover the ground fully, will you please aid the committee by giving your ideas on the subject, regardless of, or in addition to the questions?

### The Trident Water Meter.

The Water Meter Commission of New York City has officially approved and adopted the Trident meter for use in that city. A stock of meters is placed in the yard at the foot of East 24th street to be tested and sealed by the officers of the Department of Public Works, after which they are ready for prompt delivery.

### A Trestle Accident.

On the 9th a trestle fell on the Toronto, Hamilton & Buffalo Railroad near Dundas, Ontario. It is a new structure and the accident took place during construction. The greatest height is 64 ft., and just as one of the tallest bents had been raised, 16 out of 24 bents fell. Three men were seriously hurt.

### Car Heating.

The Gold storage system of heating has been put into operation on some of the cars of the Caledonian Railway of Scotland. It is used on trains between Edinburgh and Glasgow.

## THE SCRAP HEAP.

### Notes.

The Staten Island Rapid Transit Railroad Co. has under consideration the advisability of changing the motive power of the road to electricity.

At Merrill, Wis., on Jan. 17, the man who wrecked a train near Tomahawk Junction, in October last, by sawing off the stringers of a pile bridge, was sentenced to 25 years in State's prison.

The car sheds of the West End Street Railroad at Columbus avenue, Boston, were burned on the night of Jan. 16, together with 60 cars and other property, all amounting to about $105,000.

On Jan. 20 the Midland Railway of England ran a passenger train to the Liverpool dock, thus opening a line by which passengers from America can take the cars from the ship's side at Liverpool direct to London.

The Railway Gate Co., of Buffalo, has been organized to manufacture and sell the Wilder Patent Railroad Gate. The capital is $9,000, and Jacob K. Eckert, John N. Gottra, Loren F. Boies, Robert C. Hickok and Thomas Eickinson, of Buffalo, are the directors.

A Philadelphia despatch reports that President Roberts of the Pennsylvania road, in the circular notifying his subordinates to take care to obey the New York law forbidding State officers to use passes, also instructed them to "apply the same theory, in a measure," to Pennsylvania and other States.

The contributions of Southern cities for the destitute people of Nebraska up to Jan. 15 amounted to 17 cars of provisions, clothing and coal. Coal and grain have been contributed at various towns in Central Illinois and elsewhere. Some of the despatches from Illinois report that the railroads are not liberal in carrying these supplies free.

The new power house for the Hartford Street Railway Co., is now completed and is said to be one of the finest in the New England States. It is 66 ft. x 230 ft., entirely fire proof, no wood work at all being used about the building. It was designed and built by the Berlin Iron Bridge Co., and is covered with patent anti-condensation corrugated iron roofing.

The Governor's Council of Massachusetts voted on Jan. 17 in favor of pardoning Messrs. Sanborn and Bailey, officers of the Old Colony road, who are now in jail at Plymouth, for inciting men to riot at Abington last August, but at last accounts the Governor had not acted on the advice of the council. The other four railroad officers who were imprisoned have been released, their terms having expired.

The terrible explosion at Butte, Mont., on Jan. 15, appears to have originated in a hardware store, the first and most fatal shock having been due to the explosion of a large quantity of dynamite in the store. The damage from the fire and explosion in the railroad yards adjoining seems to have occurred after the conflagration had become uncontrollable in consequence of the first explosion and the disabling of the firemen by it.

The various insurance companies who suffered severely in the great lumber fire in Chicago in August, 1894, have joined issues and presented claims against the Burlington aggregating over a million dollars, on the ground that the fire was caued by sparks from an engine of that road, claiming that they have sufficient affidavits of persons who were on the ground at the time and just prior to the inception of the fire to prove that sparks from a switch engine set the fire.

The Chicago Assistant Corporation Counsel has filed a cross-bill in the litigation against the Illinois Central for operating turnstiles at way stations in Chicago in connection with its train service. The position now taken by the city will bring up again the lake front case, and it is proposed to take all the evidence possible, that it may be made a matter of record for future use regarding the original ownership of the property. The court is asked to cause the road to remove all turnstiles north of Twelfth street, and to allow the public free access to the lake shore. It is attempted in the proceeding to have the turnstiles declared a public and private nuisance.

The Illinois State Board of Railway and Warehouse Commissioners heard evidence and arguments last week at Chicago in the complaint of the Mexican Anola Soap Co., of Peoria, against the Rock Island and the Peoria & Pekin Union, alleging that the defendants refused to accept a car of freight from the Burlington road for delivery on their tracks near the factory of the complainant. The defense of the Rock Island was that the Burlington had its own terminals at Peoria, adequate for handling all its business; that defendant could not in justice to its own patrons overcrowd its own terminals by taking freight from other roads having terminals of their own; that the Burlington had never asked it to take the freight and that that road would not accept freight from the defendant for delivery on its tracks. The answer of the other defendant was that its tracks were leased to a number of other roads, and, therefore, it could not do it if it desired.

### Buffalo Grade Crossing Improvements.

The engineering department of the New York Central is now preparing specifications preparatory to letting contracts about Feb. 1 for some of the work to be done in Buffalo in connection with the depression of tracks and construction of overhead bridges at several streets near the Exchange-street passenger station. It appears that the present freight house at Green street will have to be abandoned after the new line is constructed, and the company is to build at once a large new freight house on the site bounded by Michigan, Exchange, Chicago and Carroll streets. The building will be 880 ft. long and will have 36,000 ft. of floor surface. The office building, separate from this, will be 40 ft. x 48 ft. On the south side of this freight house there will be 20 team tracks.

### Shipbuilding for 1895.

The contracts for new ships now in hand indicate a fairly prosperous year in this industry. The *Marine Review* publishes the following list of vessels under contract lake ship yards each year for nine years past:

| December 31. | Number of boats. | Capacity gross tons. | Valuation. |
|---|---|---|---|
| 1886 | 31 | 65,750 | $4,074,000 |
| 1887 | 60 | 108,525 | 8,325,000 |
| 1888 | 59 | 100,950 | 7,124,000 |
| 1889 | 56 | 124,750 | 7,866,000 |
| 1890 | 38 | 77,950 | 5,337,000 |
| 1891 | 45 | 76.000 | 4,896,000 |
| 1892 | 49 | 68,470 | 6,909,500 |
| 1893 | 28 | 26,400 | 2,538,500 |
| 1894 | 29 | 33,150 | 2,932,500 |
| Total | 395 | 681,945 | $50,000,500 |

The Northland, valued at $700,000, is included in the contracts of December 31 last. This tonnage will not much more than replace that lost during the past season viz., 31,415 tons, but there is a probability of several other large contracts being placed within a month or so.

The ships under contract on the coast are valued at $5,069,885. This includes the two American liners building at Cramp's yard. In river yards contracts for $208,000 worth, mostly steamers, are reported. The value of war vessels now under construction is $22,156,000, including engines of 85,950 horse power.

### The Lake Carriers' Association.

The third annual meeting of this association, which represents about 600,000 tons of lake shipping, was opened at Detroit on the 8th inst. William Livingston, Jr., of Detroit, was elected President, and most of the old board of officers and managers was re-elected. The report of the Board of Managers dealt with the various matters interesting the association; detailing their efforts to reduce terminal charges, procure better lighting and bouying of the channels, prevent obstructions to river navigation by bridges, and to procure the enactment of a satisfactory bill governing rafting. They objected to the Immigration bill, which prevents hiring seamen of Canadian residence; mentioned that they had notified the Interstate Commerce Commission that they would oppose the application of the Chicago rail lines for exemption from the operation of the long and short haul clause in the case of traffic competing with the lake route, and advocated the purchase by the Government of a dock at the Soo, for the purpose of improving the eastern approach to the canal.

The meeting opposed the Fithian Free Ship bill, and the Legislative Committee was instructed to co-operate with the Atlantic Coastwise Association in opposition to the bill, "if there are any indications of its passage by the present Congress." A resolution giving right of way to the Northern Steamship Company's vessels at the lock of the St. Mary's Falls Canal was defeated. The vexed question of fuel charges to coal-carrying boats was taken up. It has been asserted that coal shippers, or their agents, refuse to charter vessels unless they will buy fuel coal at from 30 to 40 cents per ton more than is charged by dealers who are not in the shipping business. After a warm but one-sided discussion of the question, in which it was asserted that last season in Buffalo vessels had paid $80,000 in excess of fair prices for fuel coal, it was resolved, among other things, "that the practice is a species of extortion contrary to the spirit of free institutions and has attained the proportions of an unbearable evil." A committee was appointed which drew up an agreement not to purchase fuel coal of shippers at Buffalo, where anthracite is shipped, and at other ports not to pay above wholesale rates; both agreements to be operative when 300,000 tons have signed.

The probable effect of the Chicago drainage canal on the level of the lakes was discussed and it was pointed out that any lowering of the surface would be more disastrous for the small harbors than for the large, as they would have greater difficulty in procuring appropriations for dredging. In view of the very great interests involved it was urged that there should be an examination of the subject by a board of experts to the end that the facts may be authoritatively determined The managers called attention to the necessity for a larger waterway between the lakes and the Atlantic, saying: "When the United States Government adopted the 20-foot channel project the vessel interests found themselves supported by the whole West and Northwest. The same support can be obtained for a new project to be undertaken as soon as the 20-foot channel is provided for." The Board made no recommendation as to the route, and the Buffalo interests came promptly forward with an endorsement of the Seymour plan.

### Concerning Passes.

We take the following from the New York *Sun:* When the police were withdrawn from the Pennsylvania road at all crossings and stations yesterday there was much gossip as to the reason. Mayor Hopkins explained, "I wanted transportation for the committee being sent to Washington to-night to work for the new Post Office, and I asked the Pennsylvania Company to help me out. They sent me back word that there was no one here in Chicago who had the authority to issue passes, and that they would have to wire East for them. I thereupon returned answer that it was high time this company had some responsible Chicago agent, and I forthwith deprived them of the privileges they were enjoying through the use of the police. I withdrew every officer working along their line, and it did not take the company long to find some responsible man here in Chicago empowered to act for the company." "Did you get your passes?" "I certainly did." "Are the police going back now?" "Yes. The company has seen fit to accommodate the city, and I am going to let them have the police again."

Concerning this the *Sun* says: "Mr. Mayor Hopkins got the passes. He seems to be proud of the fact, but if the facts are as asserted in the despatch, Chicago has very good reason to be ashamed of him. There are certain remarks about blackmail and extortion that suggest themselves, but it is well to be polite with Mayors. They do not seem to be wiser than other persons. We should like to ask Mr. Hopkins, however, if the Pennsylvania Company in Chicago is not entitled to have its property and its passengers protected by the police? It is his duty as Mayor of Chicago to see that the laws are enforced; and unless limited anarchy exists in Chicago it is an inevitable mandate of the law that the Pennsylvania Railroad Company be protected. Mayor Hopkins does not possess the right to declare a company or an individual an outlaw. Practically he did declare the Pennsylvania Company's property in Chicago to be beyond the protection of the law. This was bad enough, but the motive of the outlawry was worse. He tried to pick the pockets of the stockholders of the Pennsylvania Railroad of the sums that the fares of certain persons wishing to go to Washington and lobby and come back free of cost would amount to."

### Burial of a Freight Train in a Coal Mine.

A despatch from Hazleton, Pa., January 18, reports that on the night previous, at Audenreid, a freight train of the Lehigh Valley fell into a hole where the track, lying above a coal mine, had been undermined; and that the tender and several cars went out of sight. According to the first despatches the hole must have been 500 ft. deep, more or less, as 50 cars were said to have fallen in. Later and more temperate accounts seem to indicate that the engine got over in safety, and that the tender and first six cars fell below the level of the track. The firemen is said to have been poking the fire at the time the tender broke away from the engine, and to have been saved only by his tight grip on the poker.

Reports of this kind from the coal regions are coming to be somewhat frequent, though it will be necessary to turn on the reporters' fancy with still higher pressure in order to equal the report of the subsidence at Lindal Bank, England, on Sept. 22, 1892, when seven or eight tracks of the Furness Railway, on an embankment, sank on account of the caving in of a coal mine beneath. The engine of a freight train plunged in head first, leaving nothing but the cab in sight. A wrecking train was sent for at once, but by the time it got there the engine had fallen through, out of sight, 100 ft. or more, and at last accounts it "remained buried there to puzzle posterity."

### Lehigh Valley Coal Dock at Chicago.

The Lehigh Valley Coal Co. has obtained possession of dockage at 100th street, Chicago, for $200,000. It will establish a large coal shipping dock, from which the supply for the West, Southwest and Northwest will be distributed. Plans have been made to build an iron structure, and outside of this $175,000 will be expended in improvements within the next six months.

### The Street Railroad Strike in Brooklyn.

The strike of conductors and motormen of the electric street railroads, in Brooklyn, which began on January 14, has proved to be a long and bitter contest, and as we go to press it is still unsettled. The companies have succeeded in putting some new men at work, but more than half the lines in the city are still practically idle. The trouble has been due chiefly to the acts of lawless mobs, and it is charged even by conservative observers that the Mayor and other city authorities have pursued a weak policy, in consequence of their sympathy with the strikers. The police were unable to maintain order, and on Sunday last the State militia of Brooklyn and New York City were called out in force. Every car that runs is accompanied by policemen, and all car houses and other rallying points have to be guarded by troops. Obstructions have been placed on the tracks every day in many different parts of the city, and wires have been cut in scores of places. On Monday the linemen, some five or six hundred, decided to strike and then backed down. On Wednesday morning it was again reported that they had struck.

The general aspect of the situation, as we gather it from the reports in the daily newspapers, resembles, to a considerable degree, that of the railroad strike at Chicago last summer. The obstruction of tracks and other lawless acts are often, perhaps in most cases, the work of roughs who have little or no connection with the strike. During the first three or four days of this strike the lawlessness was mild, increasing in violence as the forbearance of the

authorities became known, and as the mob was augmented by recruits from New York. On Monday last the Brooklyn Bridge was crowded with idlers going toward Brooklyn, and a considerable percentage of the crowd were readily recognized as habitual lawbreakers.

The managers of the road are firm. Some concessions were made in conferences with the State Board of Mediation, and the men withdrew their demand for increased pay, but they would not concede other points, and refused to be taken back unless all their men could be included, and so the mediation failed. The State Board has made a report, but it contains no recommendation except that the law making 10 hours' work, within a period of 12 hours, a day's work ought to be modified, so that an employer in making up the 10 hours could not deduct small periods of waiting time between trips at terminals.

**Brooklyn Waterfront Stores and Docks.**

The Brooklyn Wharf & Warehouse Company has been incorporated with a capital of $12,500,000, divided into $7,500,000 preferred, and $5,000,000 of common stock. The object of this company is to control the storage warehouses, docking facilities and elevators in Brooklyn. The charter directors are William A. Nash, Andrew Mills and James Timpson, New York; Geo. H. Southard, Brooklyn, and Geo. W. Young, Jersey City. The following will be members of the Board. J. S. T. Stranahan, Alexander E. Orr., Wm. A. Nash, David Dows, Jr., Franklin Woodruff, H. E. Nesmith, Jr., Martin Joost, W. H. Force, Theo. A. Havemeyer, William Coverly, Thos. A. McIntyre, Samuel Taylor, Francis D. Beard, Leonard J. Busby, Timothy L. Woodruff and E. F. C. Young. Thos. A. McIntyre will be President, and David Dows, Jr., and J. S. T. Stranahan, Vice-presidents. Mr. McIntyre holds options on a number of stores and warehouses along the water front of Brooklyn, aggregating 2¾ miles, with a bulkhead extent of 4.9 miles. The new company is to build a railroad connecting the entire property. The tracks are to be laid on the large wharves so that cars brought on floats can be run to a ship's side, or grain can be taken from one elevator to a ship lying at a wharf a mile or two away. Part of the money needed to float this great enterprise will be raised on first mortgage 5 per cent. fifty-year gold bonds, and part at 6 per cent. cumulative preferred stock. Mr. McIntyre, the president and originator of the enterprise, is a member of the commission firm of McIntyre & Wardwell, Produce Exchange, New York City.

**Lake Superior Iron Ore.**

The last numbers of the *Iron Trade Review* and the *Marine Review*, of Cleveland, contain their usual full review of the Lake Superior ore trade. The total production of iron ore for the region was 7,755,494 tons, and the grand total since the opening of the mines has been 87,058,922 tons. Of this immense freightage the Marquette range has contributed 41,808,735 tons; the Menominee range, 19,383,406 tons; the Gogebec range, 16,408,770; the Vermillion range, 7,054,307 tons and the Mesaba range, 2,403,704 tons. The years of heaviest shipments have been 1890 and 1892, in both of which over 9,000,000 tons were shipped.

The shipments by ranges have been for the last two years:

| Ranges. | 1893. | 1894. |
|---|---|---|
| Marquette | 1,835,893 | 2,049,107 |
| Menominee | 1,466,197 | 1,137,949 |
| Gogebic | 1,329,464 | 1,814,086 |
| Vermillion | 820,621 | 948,503 |
| Mesaba | 613,620 | 1,785,839 |
| | 6,065,795 | 7,755,494 |

By ports the shipments have been:

| | 1893. | 1894. |
|---|---|---|
| Escanaba | 2,048,981 | 1,644,770 |
| Ashland | 1,117,524 | 1,738,590 |
| Marquette | 1,093,774 | 1,424,856 |
| Two Harbors | 903,329 | 1,373,253 |
| Duluth | 440,292 | 1,361,043 |
| Gladstone | 203,585 | 79,108 |
| Superior | 80,273 | ..... |
| All rail | 178,037 | 133,874 |
| | 6,065,795 | 7,755,494 |

**Elevation of the St. Charles Air Line.**

It is reported from Chicago that the four railroad companies interested in the above named piece of railroad have come to an agreement with the city of Chicago in regard to the elevation of the tracks above the streets, and that contracts will soon be signed. This line extends from the Illinois Central on the lake front near Sixteenth street, Chicago, westward about three eighths of a mile to the Burlington, the Alton, the Fort Wayne and other roads which intersect near Stewart avenue. The plans provide for elevating the tracks from Indiana avenue westward to Clark street. The streets between these two are Michigan avenue, which is a wide boulevard, Wabash avenue, State street and Dearborn street. The Chicago & South Side Elevated Railroad runs between Wabash avenue and State street. It appears that under the agreement the cost of elevating the South Side road, so that the St. Charles Air Line after being elevated can pass under it, is to be borne by the city.

**Coal Trade in 1894.**

The *Coal Trade Journal* prints a review of the trade during 1894, from which it appears that the amount of anthracite coal shipped during the year was 41,000,000 gross tons as compared with 43,089,536 tons in 1893. Of bituminous coal, for which no accurate statistics can be had at present, the editor estimates that the output was 112,000,000 net tons.

The Wyoming district continues to be the largest producer of anthracite; the Lehigh district shows no increase and the Schuylkill is behind. The individuals who sell their coal to the large companies at 60 per cent. of the tide-water price have not done as well as in 1893. The strike in the bituminous mines lasted from April 21 until June, and in some instances until July. It is believed that the wages now paid are hardly as good as those which ruled a year ago. Since the resumption of work competition has been sharp and operators are taking steps to form combinations. The reduction of the duty on coal imported, from 75 cents a ton to 40 cents, has not yet increased imports, though during the strike coal came here from England and Nova Scotia, and the West Virginia mines, where the men did not strike, shipped coal farther east than ever before. The Beech Creek, the Clearfield, the Cumberland and the Chesapeake & Ohio districts combined, shipped 2,200,000 tons less to the seaboard than in 1893. The cheaper grades of domestic coal have sold lower at New York than ever before. Prices at Norfolk and Newport News, f. o. b., are now $1.80 to $2.25, and at New York $2.75 to $3.

Imports of bituminous coal for ten months are reported as 1,015,337 tons as against 926,098 in 1893. Exports were about the same as in 1893, to wit., 3,000,000 tons. Freight rates by water have been very low, and the latest quotations from New York to Boston are 40 and 50 cents a ton alongside.

**Pig Iron Production for 1894.**

Mr. Swank is pleased to have gathered the returns of all our furnaces in time to announce in the *Bulletin* of the 18th inst. that our production for the past year was 6,657,388 tons. This probably is about the production of both the United Kingdom and of the Empire of Germany. The make by half years has been:

| | 1891. | 1892. | 1893. | 1894. |
|---|---|---|---|---|
| First half | 3,368,107 | 4,769,683 | 4,562,918 | 2,717,983 |
| Second half | 4,911,763 | 4,387,317 | 2,561,584 | 3,939,405 |
| Total | 8,279,870 | 9,157,000 | 7,124,502 | 6.657,388 |

Last year's production was only 72.7 per cent. of the make of 1892, and 93.4 per cent. of that of 1893, and is our smallest output since 1888.

The stocks of pig iron unsold, in the hands of manufacturers or their agents, were: on December 31, 1893, 662,068 tons; on June 30, 1894, 517,063, and on December 31, 1894, 597,688 tons. In addition to the above, there were on December 31, last, "63,640 tons in the yards of the American Pig Iron Storage Warrant Company, which had passed out of the hands of the makers, making 661,328 gross tons which may be said to have been on the market, against 575,866 tons which were similarly held on June 30, 1894." There has been a steady and noticeable increase in the unsold stocks of charcoal iron.

There were 108 furnaces in blast on January 30, 1894, as against 226 one year before, and 185 on December 31 last, compared with 137 the year before.

**Edison Illuminating Co.**

The Edison Electric Illuminating Company of New York reports its earnings for the year ending December 31 as follows:

| | 1894. | 1893. | 1892 |
|---|---|---|---|
| Gross earnings | $1,369,066 | $1,193,338 | $345.575 |
| Operating expenses | 550,426 | 572,311 | 385,494 |
| Net earnings | $818,639 | $666,027 | $557,081 |
| Total net | 851,583 | 694,248 | 577,527 |
| Legal expenses and taxes | 124,443 | 112,570 | 102,384 |
| Balance | $727,140 | $581,678 | $475,137 |
| From investments | 62,325 | 23,964 | |
| Total balance | $789,465 | $605 642 | $475,137 |
| Interest | 207,266 | 144,820 | |
| Dividends | 476,196 | 451,174 | |
| Surplus | $106,003 | $9,648 | |
| Number customers | 5,837 | 5,154 | 4,344 |
| Number lamps | 234,494 | 192,691 | 142.492 |
| Number motors | 7.616 | 5,529 | 3'807 |
| Number arc lights | 3,014 | 2.538 | 1,637 |

## LOCOMOTIVE BUILDING.

The Pennsylvania, it is said, is to build 20 new locomotives this year for the Southwest system in the shops at Altoona.

The Rhode Island Locomotive Works has received an order from the Unadilla Valley Railroad to build one eight wheel passenger engine.

## CAR BUILDING.

The Unadilla Valley has contracted with the Carlisle Mfg. Co., Carlisle, Pa., for 10 freight cars. The road has also purchased two second hand passenger coaches from the New York Equipment Co., 15 Wall street, New York City.

The order of the Boston & Maine for passenger equipment, as now decided, will be for 29 passenger and baggage cars. The company is receiving bids for this equipment, and the award will probably not be made for some little time.

The Lebanon Manufacturing Co. has secured orders from the Illinois Steel Co., of Chicago, and from the George's Creek & Cumberland Railroad Co. They have also a number of other orders, which will keep them busy for some time.

The contracts for the ventilated fruit cars, for which the Southern Railway Co. recently asked bids, have not been awarded. All the bids have been received, but the damage to the orange crop has delayed the awarding. It is probable that no contracts will be awarded.

The 60 heavy logging cars to be built by the Wisconsin Central as noted last week, will be equipped with the Chicago coupler. The company will soon commence to run 592 of its ore cars through the shops to fit them with air brakes and M. C. B. couplers; the design of coupler to be placed on this equipment is, we understand, not yet decided upon.

## BRIDGE BUILDING.

**Danville, Pa.**—The court has confirmed the recommendation of viewers for a bridge over the east branch of Mahoning Creek, near Bagdad. Its width will be 33 ft.

**Fort Wayne, Ind.**—County Bridge Superintendent W. H. Goshorn is preparing plans for 180-ft. span steel double bridge, 24-ft. roadway and two sidewalks.

**Hartford, Conn.**—The Hartford Bridge Commission has been directed by the Secretary of War to change the highway bridge over the Connecticut River at Hartford, to provide for a draw span of 100 ft. in the clear, to replace the present third span from the Hartford shore. The bridge is to be altered in accordance with this recommendation by Oct. 1 next. The contract for the work has been let to the Berlin Iron Bridge Co.

**Lurich, W. Va.**—Citizens of Giles County, Va., and Monroe and Summers counties, W. Va., have decided to organize a company to build a highway toll bridge over New River, at Lurich, to reach the Norfolk & Western on the opposite side of New River. The estimated cost of a steel bridge with stone piers and abutments is $20,000. The incorporators are W. Adair, G. W. Shumate, L. C. Wolfe, W. B. Morton, J. W. Hansbarger, F. J. Kimball, W. H. Ballard, Dr. C. W. Spangler and J. D. Logan. The Norfolk & Western will be a stockholder in the new bridge.

**Montreal, Quebec.**—Chief Engineer W. Shanley, of the Montreal Bridge Co., will receive plans and estimates for the steel superstructure of the proposed bridge across the St. Lawrence, at Montreal. The general outline of the bridge shows: 1 cantilever span, 1,250 ft; 2 side spans for same, 500 ft. each; 15 viaduct spans, south side approach, 250 ft. each; and 18 viaduct spans.

The bridge to have a double line of railroad track; two lines of rails for electric street car service; highway for ordinary wheel vehicles, and two footways.

**Stockbridge, Mass.**—The Laurel Hill Association have awarded the contract for a concrete arch of 100 ft. span over the Housatonic River to Ice Glen to the Melan Arch Construction Company. Plans and specifications have been drawn by Mr. Fr. von Emperger, Constructing Engineer, 71 Broadway, New York City. It will be built as soon as the season will permit and will be the largest concrete arch in this country.

**Sunbury, Pa.**—The Sunbury Bridge Co. was incorporated in Harrisburg, Pa., January 22, with a capital of $80,000. The directors are: D. P. Rockefeller, President; G. H. Gibson, W. H. Lyons, R. F. Adens, J. K. McWilliams, Sunbury. The company proposes to construct a bridge over the Susquehanna River at this point.

**Toledo, O.**—The specifications for the proposed bridge across Cherry Creek, on Third avenue, have been completed by the Board of Public Works and the call for bids for its construction have been published. The cost of the bridge is estimated at $3,500.

**Tuscaloosa, Ala.**—The bridge crossing the Warrior River, which is owned by the County, must be changed into a drawbridge before September next, according to a recent order from the Secretary of War. The order is the result of the Government improvements in the Warrior River, which have made that river navigable for steamboats several miles above the present location of the bridge. The order requiring the construction of a new draw will require the building of a new pier, taking out a span of 190 ft. and replacing it with a new span. The work will cost about $20,000.

## MEETINGS AND ANNOUNCEMENTS.

**Dividends.**

Dividends on the capital stocks of railroad companies have been declared as follows:

*Buffalo & Susquehanna*, 4 per cent., for year ending Dec. 31, payable on demand.

*Illinois Central*, semi-annual, 2½ per cent., payable Mar. 1.

*Nashville, Chattanooga & St. Louis*, 1 per cent., payable Feb. 1.

*Pullman's Palace Car Co.*, quarterly, $2 per share, payable Feb. 15.

**Stockholders' Meetings.**

Meetings of the stockholders of railroad companies will be held as follows:

*Cumberland*, annual, Montreal, Feb. 13.

*Kingston & Pembroke*, annual, Kingston, Feb. 13.

*Missouri, Kansas & Texas*, special, Parsons, Kansas, Feb. 14, to ratify the lease of the Southwestern Mineral.

*Montreal & Atlantic*, special, Montreal, Feb. 11.

*Nipissing & James Bay*, annual, Toronto, Jan. 31.

*Wheeling & Lake Erie*, annual, Toledo, O., Feb. 12.

**Technical Meetings.**

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Freight Claim Association* will hold its annual meeting in Chicago on March 13. The headquarters will be at the Auditorium. The Secretary is S. A. Mehorter of Philadelphia.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October, at 10 a. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station, on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 51 Lakeside Building, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

**Civil Engineers' Society of St. Paul.**

The twelfth annual meeting of the Civil Engineers' Society of St. Paul was held on Jan. 7. Fifteen members and one visitor were present, Vice-President Estabrook presiding. The discussion of the Minnesota State Survey and other matters incidental thereto was entered into at considerable length, and the committee was granted another month's time to make a report. The gift of various back numbers of the *Railroad Gazette* and other periodicals was accepted from the Omaha Railroad Co., and ordered bound. The annual reports were read and accepted and the following officers elected for the coming year: President, N. E. Stevens; Vice-President, K. E. Hilgard; Secretary, C. L. Annan; Treasurer, A. O. Powell; Librarian, A. Munster, and Representative on Board of Managers for the Association of Engineering Societies, Edwin E. Woodman. A vote of appreciative recognition of past services was given to Mr. Morris and other retiring officers.

**The Engineers' Society of Western Pennsylvania.**

The fifteenth annual meeting of the Engineers' Society of Western Pennsylvania was held in the Carnegie Library Building, Allegheny, last week. The reports of officers and committees were read, and the retiring President read his address. The election of officers for the ensuing year resulted as follows: President, one year, Thomas H. Johnson; Vice-president, two years, Emil Swensson; directors, two years, Harry J. Lewis and Karl F. Stahl; Treasurer, one year, A. E. Frost; Secretary, one year, Daniel Carhar.

**The Engineers' Club of Philadelphia.**

The Engineers' Club held its sixteenth annual meeting at its club house, 1122 Girard street, Philadelphia, last week. John C. Trautwine, Jr., the retiring President, made an interesting address, illustrated by lantern views and plans, reviewing engineering progress during the year, describing the Delaware River and Harbor, the Reading Subway, the Pennsylvania Railroad bridge over the Delaware River at Frankford, the extension of the trolley system, the Bourse Building, the proposed Falls bridge, and various other public and private improvements about Philadelphia.

The result of the annual election was as follows: President, George S. Webster; Vice-president, John L. Gill,

Jr.; Secretary, L. F. Rondinella; Treasurer, George T. G. Williams; Directors, Henry Leffmann, W. C. Furber and Edgar Marburg.

**Ohio Society of Civil Engineers.**

The Ohio Society of Civil Engineers, elected the following officers at the annual meeting at Cincinnati last week: President, J. L. Culley, Cleveland; Vice-president, F. M. Turner Dayton; Secretary and Treasurer, Charles A. Judson, Sandusky; Trustees, J. H. Harper, Cincinnati; B. A. Bryan, Portsmouth; P. B. Opdyke, Pulaski; J. A. Manlon, Coshocton, and Professor E. A. Kemler, Columbus.

**Iowa Society of Civil Engineers.**

This society elected the following officers for the ensuing year, at the annual meeting last week at Dubuque, Ia.: President, Prof. L. Higgins, Des Moines; Vice-president, C. R. Allen, Ottumwa; Secretary and Treasurer, Seth Dean, Glenwood; Directors, E. E. Anderson, Dubuque; W. Stegh, Burlington.

**Canadian Society of Civil Engineers.**

At the January meeting of the club at its rooms, 112 Mansfield street, Montreal, a paper was read by Mr. H. A. Gray, member of the Society, on the "Great Lakes, Their Commerce and Physical Features." There was also a discussion on a paper by Mr. H. F. Perley, on the "Resistance of Piles," which was read at a previous meeting of the Society.

The programme for the ninth annual meeting which is to be held at Montreal beginning Jan. 24, extending over that day and Friday, has been issued. Thursday was given up to excursions to various points of interest about Montreal, including the car shed and power house of the Montreal Street Railway, the Montreal Water Works, the shops of the Dominion Bridge Co., Montreal Wheel & Pipe Founding Co., and other firms. On Thursday evening there will be dinner at the Windsor Hotel. On Friday the sessions will be at 10 o'clock and 2:30 P. M., and at 8 o'clock at McGill University. At the evening meeting a paper on "The Strength of Douglas-fir, Red-pine, White-pine and Spruce," will be read by Professor H. T. Bovey, M. A. LL.D, and illustrations of the methods employed will be given in the laboratory.

**General Baggage Agents' Association.**

The fourteenth annual convention of the American Association of General Baggage Agents was held in St. Louis on Jan. 16. About 100 members were present, and Mr. H. P. Dearing, of the Michigan Central, President of the Association, presided. The custom of allowing 350 lbs. of baggage free on tickets going across the Pacific Ocean was discussed and a protest against such a large allowance was formulated. The committee on making excess baggage rates uniform made a strong recommendation in that direction. A committee was appointed to prepare a uniform release, to be used when baggage is carried which involves unusual risks. The Central Traffic Association was congratulated on its recent rule imposing a charge for the transportation of bicycles and baby carriages. The next meeting will be held at Buffalo. The following officers were elected for the ensuing year: President, Charles Lorraine, of the Chesapeake & Ohio; Vice-President, G. E. Zippel, of the Delaware, Lackawanna & Western; Secretary and Treasurer, J. E. Quick, of the Grand Trunk, Detroit. This will be Mr. Quick's eleventh term in office.

**Western Railway Club.**

The Western Railway Club held one of the most successful meetings in its history on Tuesday, Jan. 15, convening in the Auditorium Hotel, Chicago. President Gibbs occupied the chair. There were about 100 members in attendance. The club is keeping up its record for rapid increase in membership, taking in 26 new members at this meeting. The record in this line for the current season is as follows: 104 new members in September, 31 in October, 57 in November, 24 in December, and 26 in January. The total membership is now about 500. A notable feature of this new membership is the free representation of the non-mechanical departments of railroads, the general managers, general superintendents of transportation, purchasing agents, civil engineers, roadmasters etc., all having representation in the new lists.

The subject discussed at the January meeting was Locomotive Fuel, being based upon the admirable paper presented at the December meeting by Mr. Wm. Forsyth, of the C. B. & Q. The discussion was extended and thorough, and was supplemented by a paper presented by Mr. S. P. Bush of the Pan Handle, on "Methods of Obtaining Economy in the use of Fuel on Locomotives." A paper was also presented by Mr. F. A. Delano, of the C. B. & Q., entitled "Notes on English Railway Practice." This paper, which was very comprehensive, and of much practical interest, will be valued as one of the best monographs on the subject. As an indication of its comprehensiveness, we append a list of its subheadings, viz.: The Right of Way and Structure; The Track and Roadbed; The Locomotive Department; Passenger Service; Freight Service, Station Service; Signaling; Organization; Savings, Superannuation, Insurance and Pension Funds; Recruiting the Service; The Board of Trade and Parliament; The Clearing House; Grade Crossings.

At the next meeting of the club, which will be held February 19, Mr. Geo. Gibbs of the Chicago, Milwaukee & St. Paul, will read a paper entitled "Notes on Modern Practice in Signaling."

## PERSONAL.

—Mr. Horace W. Hibbard, General Freight Agent of the Vandalia Railroad, died last week in St. Louis, of heart failure.

—Mr. J. J. R. Croes, C. E., is investigating the condition of the water works plant at Pine Bluff, Ark., for the Receiver of the Water Co.

—Mr. William H. Sheldon, General Manager of the Poughkeepsie & Eastern Railroad, died in an hospital in Poughkeepsie, N. Y., last week.

—Mr. George T. Williams, Secretary and Treasurer of the Union Stock Yards & Transit Co., in Chicago, for about 28 years, has resigned on account of ill health.

—Mr. F. E. Voight, formerly Master Mechanic of the Cincinnati, Lebanon & Northern, has resigned that position. He had been with the company for the last ten years.

—Mr. D. W. Caldwell was elected President of the Pittsburgh & Lake Erie Railroad Company at the annual meeting last Tuesday, in the place of the late John Newell.

—Mr. C. A. Swineford, formerly Superintendent of the Madison division of the Chicago & Northwestern Railroad, died suddenly at Baraboo, Wis., on January 18, of apoplexy.

—Hon. Thomas W. Mason, Railroad Commissioner of North Carolina, received the complimentary vote of the Democrats in the State Legislature this week for United States Senator.

—Mr. John M. Thurston, who has been elected a United States Senator from Nebraska, is General Solicitor of the Union Pacific Railroad.

—Mr. Benjamin F. Newcomer, President of the Safe Deposit & Trust Co., of Baltimore, has been selected to succeed the late ex-Gov. Bowie as President of the Baltimore & Potomac Railroad.

—Mr. E. F. Conklin, President of the Railroad Commission of South Dakota, has established his office in the Capitol at Pierre. The office of the Secretary of the Commission will be at the same place.

—Mr. A. J. Gibbons, of Terre Haute, Ind., has been appointed Chief Engineer of the Vandalia Line, with headquarters in that city. Mr. C. Downing succeeds Mr. Gibbons as Engineer of Maintenance of Way.

—Mr. G. C. Goss, formerly Purchasing Agent of the Cincinnati, Portsmouth & Virginia Railroad, and Superintendent of the Dayton, Lebanon & Cincinnati Railroad, died suddenly at Winchester, O., last week.

—Mr. C. S. Simms has been appointed Assistant Superintendent of the Pittsburgh, Fort Wayne & Chicago Railroad, between Crestline and Chicago. He was formerly Engineer of Maintenance of Way on the road.

—At a meeting of the Tennessee Coal, Iron & Railroad Company Directors, held in New York last week, Mr. G. B. McCormack, who has been Assistant General Manager, was elected to the office of General Manager, made vacant by the resignation of Manager T. H. Aldrich, received some time ago.

—Major Joseph W. Paddock, Government Director of the Union Pacific Railroad, died at his home in Omaha, on Jan. 20, of pneumonia, contracted on a recent trip to Denver. Major Paddock was born in St. Lawrence County, New York, 69 years ago. He had been a resident of Nebraska nearly 40 years.

—Mr. E. B. Gibbs, Master Mechanic of the Oregon Railway & Navigation lines, with headquarters at Albino, Ore., has recently resigned that position. He was appointed to the office while those lines were operated by the Union Pacific, and he will probably return to the service of that company.

—Mr. Samuel B. Jones, who had been General Eastern Agent of the Louisville & Nashville Railroad, at New York City, for the last 25 years, died suddenly on January 19. He had been with the company for about 39 years, and was at one period Division Superintendent of the Memphis division of that road, with headquarters at Memphis.

—Mr. B. Thomas has been elected Chairman of the General Managers' Association of Chicago, to succeed Mr. E. St. John, resigned. Mr. Thomas was President and General Manager of the Chicago & Western Indiana and the Belt Railway at Chicago, having held that office since 1891. He was previously on the Erie road as General Superintendent.

—Mr. Joseph M. Rogan is now connected with the Carpenter Steel Co., of Reading, Pa., and will be located in Chicago to look after the railroad business of the company. The chief product of this company is air-hardening steel, the manufacture of which is controlled by the company exclusively. It is made by a secret process, the invention of the company's officers, and has proved to be a steel of superior qualities.

—Mr. W. S. Clarkson has been appointed Master Mechanic of the Rocky Mountain Division of the Northern Pacific in place of Mr. A. Harrity, resigned, and F. N. Risteen, of the Dakota and Missouri Divisions to succeed Mr. J. E. Phelan, resigned. For the past 12 years Mr. Clarskon was round house foreman for the company. Mr. Risteen has been in the service of the company for about 10 years as locomotive engineer and road foreman of engines.

—Mr. R. B. F. Pierce, of Indianapolis, has been chosen by Judges Woods, Allen, Baker and Ricks, of the Federal Court, to succeed S. R. Callaway, of Toledo, as Receiver of the Toledo, St. Louis & Kansas City Railroad. Mr. Pierce is at present Trustee of the Indianapolis, Decatur & Springfield road. He will assume charge as soon as the resignation of Mr. D. D. Davis, of Toledo, who was appointed by Judge Ricks, but not confirmed, has been accepted.

—Mr. J. M. Barr has been appointed General Superintendent of the Western district of the Great Northern, with headquarters at Spokane, Wash. He succeeds Mr. J. N. Farrell, resigned. Mr. Barr entered the service of the Great Northern last September as Superintendent of the Breckinridge Division, previous to which time he was Superintendent of the Milwaukee and Council Bluffs Division of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago.

—Mr. Reginald Canning died on January 18, after a sudden attack of pneumonia. He was 44 years old, and was in partnership with Mr. E. T. Canby, dealing in railroad equipment. When quite young he was in the service of the Ramapo Wheel & Foundry Co., which he left to establish the Cayuta Wheel & Foundry Co. He was for a short time assistant to the President of the Jackson & Sharp Co. He was an expert in rolling stock, and an honest, lovable gentleman.

—Sir Edward Leader Williams, Chief Engineer of the Manchester Ship Canal, has relinquished the active control of the canal works, now that the construction of the canal is completed, but he will retain the title of Chief Engineer, and will continue to advise the company on all matters relating to engineering, and, in particular, will take charge of all arbitrations and disputes in which engineering questions are involved. Mr W. H. Hunter, who has been Principal Assistant Engineer of the canal for many years, will have control of the executive work, and the engineering staff will be under his direction.

—Mr. Alexander H. Bauer, Chief Electrician of the Pullman Palace Car Co. for the past eight years, died suddenly in New York last week. The arrangment for electric lighting by an engine and dynamo in the baggage car, in use on a great many Pullman cars, was devised by Mr. Bauer. Before going to the Pullman Company he had been connected for nearly 20 years with various telegraph companies, and was for some time the Boston Manager of the Baltimore & Ohio Telegraph Company, and before that was Manager in Baltimore of the Gold & Stock Telegraph Company and of the Mutual Union Company.

—Mr. V. A. Riton has been appointed Superintendent of the Cascade division of the Great Northern road, with headquarters at Leavenworth, Wash. He succeeds Mr. F. L. Corwin, who is transferred to the Breckenridge division at Willmar, Mt. Mr. J. M. Barr, who has been Superintendent of the latter division, has been made General Superintendent of the western division of the Great Northern. It is an interesting fact that Mr. Barr and Mr. Riton, as well as Mr. E. W. McKenna, General Superintendent of the eastern division of the road, have been, until recently, in the service of the Chicago, Milwaukee & St. Paul road.

—Mr. A. B. Burtis is now connected with the old established firm of The Lowe Brothers Co., of Dayton, O., manufacturers of paint, and will have charge of that firm's railroad department. Mr. Burtis is known as recently the senior member of the firm of the Burtis, Patterson & Sargent Company, of Cleveland, retiring about a year ago. Before establishing that firm Mr. Burtis was for many years manager of the railroad department of Messrs. Sherwin, Williams & Co., of Cleveland. He is very well known among railroad officials, and he has had a long experience in the manufacture of paints used in railroad work.

—Mr. Frank Tibbetts, Division Roadmaster of the Missouri, Kansas & Texas, in Texas, has recently resigned. Mr. Tibbetts is a civil engineer of much ability and experience. He went to the Missouri, Kansas & Texas about two years ago as Roadmaster at Houston, Tex. Before that he was with the Kansas City Wyandotte & Northwestern for some years as Assistant Chief Engineer and Chief Engineer during its construction, and afterwards as Superintendent of Roadway and Bridges and Buildings, being with that company altogether about five years. Formerly he was Assistant Chief Engineer of the Cleveland, Lorain & Wheeling road in Ohio.

—Mrs. Nancy W. Adams, wife of Mr. F. D. Adams, Master Car Builder of the Boston & Albany road, died at her late residence Newton, Mass., Wednesday, January 16, aged 73. Funeral services were held at the residence, Friday January 18, and were largely attended by railroad and supply men. The remains were taken to Buffalo in President Bliss' private car for interment. Mrs. Adams was a familiar figure at the M. C. B. conventions, which she had attended with her husband a great many years. Mr. and Mrs. Adams celebrated the fiftieth anniversary of their marriage in September last. Mr. Adams has the sympathy of a large circle of friends in his bereavement.

—Mr. Lermond Watts, the veteran Superintendent of Bridges of the Chicago, Burlingon & Quincy Railroad, who died at his home in Aurora, Ill., Jan. 10, was a man of unusual parts. He was born in Maine in 1839, and for many years had been noted as a strictly first-class bridge builder. His experience in this line of work was widely varied, and he was wont to occasionally remark that he could travel from the Atlantic to the Pacific without once leaving a line of road upon which he had not at some time in his busy career built bridges. Mr. Watts was notably industrious, unassuming, imperturbable and forehanded—this latter qualification resulting in his leaving a very comfortable fortune to his wife.

—Mr. J. J. Byrne, for a long time Passenger Traffic Manager of the Atchison, Topeka & Santa Fe, has been appointed General Passenger Agent of the Southern California and the Atlantic & Pacific, with headquarters at Los Angeles, the office he formerly held being abolished. H. G. Thompson is transferred from Los Angeles to Chicago, and takes charge of the Passenger Traffic Manager's office. General Passenger Agent George T. Nicholson, whose office has hitherto been at Topeka, will have his headquarters at Chicago hereafter. W. J. Block, Assistant General Passenger Agent, will be transferred to Topeka. The office of Assistant Freight Traffic Manager will be abolished.

—Prof. Hiram A. Hitchcock, Professor of Civil Engineering in the Thayer School, Dartmouth College, died last week of pneumonia. He was born in Boston in 1857, and was graduated from the Chandler Scientific Department of Dartmouth College in 1879 and from the Thayer School in 1881. He was Assistant Engineer for the New York, West Shore & Buffalo Railroad and assistant in the Delamater Iron Works in New York City. In 1883 he returned to Hanover and took up the work in which he had since been engaged. He was engineer and inspector for the Vermont Railroad Commissioners in 1889, and had been twice to Nicaragua as consulting engineer on the canal survey. He was a very successful and popular instructor.

—Dr. Robert H. Lamborn, whose death was announced in New York last week, was born near Kennett, Penn., in 1835. He studied in Germany, and returning to this country, went to Altoona, and was connected with the engineering department of the Pennsylvania Railroad. He was the first Secretary of the American Iron & Steel Association; was active in the organization in 1866 of the Pennsylvania Steel Co., and was its Treasurer for several years. He was Secretary and Treasurer of the Lake Superior & Mississippi Railroad in 1869, and until its completion from St. Paul to Duluth, and was Managing Director of the Colorado Coal & Iron Co. from 1880 to 1883, when its steel plant was built at Pueblo, Col. He was closely associated with Gen. William J. Palmer in many enterprises in Colorado and Mexico, being interested in the organization of the Mexican Central, and Denver & Rio Grande, and Vice-President of the latter. Of late years he had devoted himself chiefly to literary and scientific pursuits. He traveled widely in this country and Europe.

—Mr. John B. Smith, President of the Erie & Wyoming Valley Railroad, died at his late residence in Dunmore, Pa., on Jan. 16, at 7.55 A. M., after only a day's serious illness. He was born in Sullivan County, N. Y., June 7, 1815, and was a son of Capt. Charles Smith, a native of Connecticut, who served in the War of 1812, and was a contractor. The son was educated in the common schools of his neighborhood and at Carbondale, Pa. He entered the railroad service when but 15 years old, in the employ of the Delaware & Hudson Canal Co. In the year 1831 he entered the machine shops of the company serving five years. From 1848 to 1850 he was mechanical draughtsman and Superintendent of Machinery for the Pennsylvania Coal Co., and from 1850 to the time of his death General Superintendent of the Pennsylvania Coal Co., in Pennsylvania. In November, 1882, he was elected President of the Erie & Wyoming Valley Railroad Co., remaining as such until the time of his death. Under his patent the three cylinder locomotives now in use extensively on the E. & W. V. R. R. were built, the first of the kind to operate successfully.

—Mr. Edward Canfield, Chief Engineer of the New York, Ontario & Western Railroad has been appointed General Superintendent, and will have charge of the transportation and right of way departments. Mr. Canfield succeeds Mr. James P. Bradfield, who becomes Superintendent of the New York Central & Hudson River Railroad for its Western Division, with headquarters at Buffalo. With the promotion of Mr. Canfield the office of Chief Engineer, which he held, has been abolished. Mr. Canfield was first Division Engineer of the Syracuse Northern Railroad, then Division Engineer with the Atlantic & Great Western Railroad, afterward Division Engineer with the Syracuse, Geneva & Corning Railroad, and in 1879 and 1880 Assistant Engineer on the Buffalo Division of the Erie Road. From 1880 to 1882 he was Resident Engineer of the Buffalo & Rochester Division, which he left to become Superintendent of the Southern Division of the Ontario & Western Road. From 1884 to 1888 he was Superintendent

of the Middle Division. Since then he has been Chief Engineer in charge of construction work.

—The appointment of Mr. J. P. Bradfield, General Superintendent of the New York, Ontario & Western, to be Superintendent of the Western Division of the New York Central & Hudson River Railroad, which has been reported for some time, was last week confirmed, and it is announced that Mr. Bradfield will assume his new duties on February 1. He succeeds Mr. George H. Burrows, who has been in poor health for over a year, and has been at his old home, in New England, on leave of absence. Mr. Burrows is now over 72 years of age, and was with the New York Central Railroad as Division Superintendent at Buffalo as long ago as 1853. He was afterwards General Superintendent of the Toledo, Wabash & Western for a long period, and was later General Superintendent of a number of other railroads. In 1873 he returned to the New York Central as Superintendent of its Western division, which office he has retained up to the present time.

Mr. Bradfield has been with the Ontario & Western as General Superintendent since February, 1893, and previous to that time was connected with the West Shore Railroad. For five years, up to 1890, he was Superintendent of the Hudson River division of that road, and for about two years after that date he was Superintendent of the Buffalo division.

## ELECTIONS AND APPOINTMENTS.

*Atchison, Topeka & Santa Fe.*—Arthur G. Wells, formerly Secretary to Vice President D. B. Robinson, has been appointed General Superintendent of the Atlantic & Pacific Railroad, succeeding Mr. T. R. Gabel, who has resigned to accept service with another company. Mr. Wells went to Albuquerque, N. M., about a month ago, being transferred to that position from Chicago on account of ill health.

*Bangor & Aroostook.*—G. F. Snow, has been appointed General Freight Agent, and W. M. Brown, Assistant Superintendent in charge of the line between Old Town and Greenville, and Milo Junction and Katahdin Iron Works. The latter will also continue to act as General Train Despatcher for the entire system.

*Brooklyn Elevated.*—The list of Directors published in this column January 11, contained several errors in names of Directors. The notice should have read: W. Halls, Jr., and Albert Snedeker were elected Directors, the item having read William Pond, Jr., and Elbert Snedeker. Elisha Dyer, Jr., was elected Secretary and Treasurer of the company, and was also made the Executive Officer, instead of the Vice-President, Mr. Anthony Barrett, who retired from that position. Mr. Barrett was elected General Manager at the annual meeting a year ago, as well as Vice-President, but practically retired from the former office in July last, when Mr. Isaac D. Barton was elected General Superintendent.

*Columbus, Sandusky & Hocking.*—At the annual meeting of the Company, held at Columbus, O., Jan. 21, the present management was continued for another year. The election of directors resulted as follows: Henry W. Putnam, Jr., and Dudley Evans, New York; C. W. Hinchman, Philadelphia; J. H. Stewart and E. H. Zurhorst, Sandusky; Chase Andrews, Zanesville; S. G. Gray, W. E. Guerin, H. D. Turney, G. C. Hoover, F. J. Picard, G. W. Sinks, Theodore Leonard and C. D. Firestone, Columbus. In the election 48,000 shares were represented. Orland Smith, Vice-President of the Baltimore & Ohio Railroad, was chosen a director, but declined to serve. The Board organized by electing the following officers: President, W. E. Guerin; Vice-President, F. J. Picard; Secretary, H. D. Turney; Treasurer, G. C. Hoover. Heretofore there have been two vice-presidents. Of the new directors, Mr. Putnam is the largest security holder in the road, Mr. Hinchman represents the Philadelphia interests, which hold over $600,000 in bonds of the road. He was president of the construction company which built the Denver & Rio Grande Railroad. Mr. Evans is vice-president of the Wells-Fargo Express Co.

*Great Northern.*—Charles J. Brooks, who has been the city Ticket and Passenger Agent of the Chicago Great Western at Des Moines, Ia., for a year, has accepted the position of district passenger agent of the Great Northern, with headquarters at Duluth.

*Lehigh Valley.*—At the annual meeting of the company at Philadelphia, on January 15, the old management was re-elected, as follows: President, Elisha P. Wilbur; Directors, Charles Hartshorne, William L. Conyngham, William A. Ingham, Robert H. Sayre, James I. Blakelee, John R. Bell, John B. Garrett, Charles O. Skeer, Beauveau Borie, Joseph Wharton, Thomas McKean, George H. Myers.

*New York, Ontario & Western.*—Edward Canfield has been appointed General Superintendent, vice J. P. Bradfield, resigned, and will have charge of the Transportation and Maintenance of Way departments. The office of Chief Engineer has been abolished

*Philadelphia & Reading.*—J. H. Sessions, Northwestern Sales Agent of the Philadelphia & Reading Coal & Iron Co., has been appointed Northwestern Freight Agent of the railroad company, with headquarters at Minneapolis. He was formerly General Freight and Passenger Agent of the Terre Haute & Peoria, and afterwards Assistant General Freight Agent of the Big Four roads.

*Pittsburg & Lake Erie.*—This company and its leased lines held their annual meetings at Pittsburg, on January 22. About 85 per cent. of 6,000 shares were voted, mainly by proxy. The Vanderbilt interest was represented by James H. Tillinghast, of Buffalo, and Judge J. H. Reed, of Pittsburg. The following were elected for the Pittsburg & Lake Erie: President, D. W. Caldwell; Directors, Cornelius Vanderbilt, William K. Vanderbilt, F. W. Vanderbilt, Hamilton McK. Twombly, E. D. Worcester, J. H. Reed, M. W. Watson, Henry Hice, A. E. W. Painter, James H. Bailey, J. M. Schoonmaker and D. Leet Wilson. The separate election of the Pittsburg, McKeesport & Youghiogheny, of which the Pittsburg & Lake Erie is lessee, resulted in the choice of J. H. Reed for President, and the following directors: Cornelius Vanderbilt, William K. Vanderbilt, Hamilton McK. Twombly, James H. Tillinghast, D. W. Caldwell, James M. Bailey, J. M. Schoonmaker, M. Watson, Henry Hice.

*Pittsburg, Fort Wayne & Chicago.*—C. S. Simms, formerly Engineer of Maintenance of Way, has been appointed Assistant Superintendent. His jurisdiction extends from Crestline to Chicago.

*Portland & Ogdensburg.*—At the annual meeting of this company, which is operated by the Maine Central, the following Directors were elected: Charles H. Amsden, James F. Hawkes, Thomas P. Shaw, George W. True, James P. Baxter, Samuel J. Anderson, Weston F. Milliken, John W. Deering, Edward B. Winslow and Theodore A. Josselyn.

*Union Stock Yards and Transit Co.*—At the annual meeting of the Board of Directors of the company last week the following officers were elected for the ensuing year: Nathaniel Thayer, Boston, President; John B. Sherman, Chicago, Vice-president and General Manager; E. J. Martyn, Chicago, Second Vice-President; James H. Ashby, Chicago, General Superintendent; J. C. Dennison, Chicago, Secretary and Treasurer; Walter Doughty, Chicago, Assistant Secretary and Treasurer. At the stockholders meeting earlier in the week, the number of directors was reduced from eleven to seven members, and the representatives of the railroads were not re-elected.

## RAILROAD CONSTRUCTION,
### Incorporations, Surveys, Etc.

**Baltimore & Cumberland.**—One of the directors of the West Virginia Central & Pittsburg Railroad is authority for the statement that a contract has been let for the construction of 20 miles of the proposed extension from Cumberland to Hagerstown, via Hancock. The contract embraces the heaviest part of the work.

It is given out that the construction work on the railroad will be commenced in another month. The company over a year ago asked for bids, of which a large number were received. It is not known if new bids will be asked for, or the old bidders asked to renew their old bids.

**Beaver Creek Coal and Lumber Co.**—This concern, which is now operating six miles of its own road in Grant County, W. Va., will soon begin building another extension, about seven miles in length, from its present terminus, to the Falls of Stony River, in the same county. The new road is to furnish shipping facilities for a new mine to be opened there, but it will also be used for any general traffic offered.

**Cairo & Kanawha Valley.**—The extension of this road from its present terminus at Hughes River, in Wood County, W., Va., to Grantsville, Calhoun County, a distance of 20 miles, is being discussed. The road now extends from the Baltimore & Ohio at Cairo, W. Va., to the Hughes River, 24 miles, and has a large local traffic, besides carrying much timber to the Baltimore & Ohio. President W. S. Wilson has asked the County Court of Calhoun County for a County subscription of stock for the extension to Grantsville. The proposition will be voted on next month.

**Calgary & Lethbridge.**—This company is applying to the Dominion Parliament for a charter to construct a railroad from Calgary to the town of Lethbridge, and thence to the international boundary.

**Chicago, Paducah & Memphis.**—The construction work on this railroad through Illinois is being rapidly pushed to completion. It is within a few miles of Mount Vernon, Ill., and it is expected that the gap between the northern and southern sections will be completed in another week.

**Cleveland, Wooster & Muskingum Valley.**—Work has stopped on this Baltimore & Ohio extension from Wooster to Millersburgh, O. The theory is that the contest over the Valley road at Cleveland is the cause, and that no work will be done until a route has been secured to Zanesville, or to Cambridge coal fields.

**Colorado, Wyoming & Great Northern.**—This railroad, incorporated in Colorado last fall, is said to have bright prospects of an early realization of part of its plans. It is stated that bonds to the amount of $3 000,000 have been sold, and work is to be pushed during the coming season in the construction of the line. The Little Book Cliff road, running north from Grand Junction to Carpenter, a coal station twelve miles distant, is the nucleus of this new route to the northwest. This coal line has been in operation for four years, and it has paid a profit of 15 per cent. upon the capital invested. Last year the daily coal tonnage was 150 tons, and the total earnings reached $70,000. This new corporation embraces all the franchises of the Little Book Cliff company, valued at $140.000, and the new concern starts with a capital of $1.000.000. The board of directors are W. T. Carpenter, President; T. E. Sanford, Melvin O. Whitehead, Criss F. Lass and James P. Nesbitt. The general offices are at Grand Junction, and E. H Saltiel, of Denver, is financial agent for the company. Mr. Saltiel is the authority for the statement that the bonds for the amount of $3,000 000 have been sold. The country to be traversed by this line has resources that can easily be developed. The agricultural districts are capable of producing fruits, vegetables, and all the grains. The hills abound in coal, marble, asphalt, red ochre, iron ores, and numerous districts where precious metals have been mined in the past in a primative way. The whole district has scarcely been prospected by settlers. The company now has an output of 2.000 tons of coal a day.

**Darien & Western.**—The engineers of the railroad have arrived in Darien, Ga., after completing the survey all the way from Crescent to Darien. The rails are being laid rapidly. The road is now built almost to Baywood.

**East & West Alabama.**—C. A. Avery, of the Columbian Equipment Company, of New York, owners of the East & West Alabama Railroad, is at Birmingham, Ala., arranging to extend that line from Pell City to Birmingham, work to commence in February. Mr. Avery's company has purchased two street railroads at Birmingham, to be used as terminals, at a cost of $350,000.

**Florence Southern.**—This newly incorporated company aims to supply the residents of Wet Mountain Valley, Col., with transportation means. The Denver & Rio Grande maintained a branch to Silver Cliff through Grape Creek canon, at heavy expense for a long time, but the freshets of that narrow canon made the cost of maintenance too great, and the road was finally abandoned. Now it is proposed to construct a line from Florence over the mesas, and through Oak Creek canon, which route is said to be free from damages from floods. The authorized capital is $1.000,000. The incorporators are W. E. Johnson, President of the new Florence and Cripple Creek; W. K. Johnson, J. A. McCandlass, J. B. Orman, H. H. Thompkins, Hosea Townsend and C. H. Johnson. This proposed line will be an adjunct of the Florence & Cripple Creek. It would form a most satisfactory adjunct, too, for the vegetables and products of the Wet Mountain Valley ranches would form a good business for transportation into the mining districts of Cripple Creek.

**Gulf & Interstate.**—President E. De Normandie of Galveston, Tex., reports that on the line from Bolivar Point, opposite Galveston, the grading has been virtually completed to Beaumont and the bridging for about 20 miles has also been finished. Arrangements are now being made for the rails to begin track laying, which, it is expected, will commence as soon as rails can reach Galveston. Every effort is being made to hasten the delivery of the rails and to build the road as rapidly as possible. Responsible parties have guaranteed to take the bonds for the entire line of road in Texas. Under its present charter the company has the authority to build a railroad from Port Bolivar, in Galveston County, northwesterly to the Red River and a branch line from a point in Galveston or Chambers counties to a point on the Sabine River in Newton County. The branch road is the only part of the work now under construction.

**Idaho Northern.**—Leonidas Merritt, of Duluth, President of the Idaho Northern, organized last fall, has written that the bonds of the company have been sold, contingent, however, upon the mine owners and property holders of this section furnishing a guarantee of a certain amount of traffic. Should the guarantee be made, work doubtless will be commenced this spring.

**Intercolonial.**—The contract for the construction of the Dartmouth branch railroad, 10½ miles from Dartmouth to Windsor Junction, N. S., has been awarded. Daniel McGregor, of New Glasgow, secured the section on the Dartmouth end, and Thomas Cook, of New Glasgow, the Junction section.

**La Porte, Houston & Northern.**—Active work on the construction of the road into La Porte, Tex., will be resumed in a few days and pushed to an early completion. General Manager W. R. Hammett is now in New York, and has closed a contract for the necessary amount of rails and material for the completion of the connections at Harrisburg and La Porte, as well as for the gap between La Porte and North Galveston. The connection with the Houston Belt & Magnolia Park at Harrisburg will require the construction of less than two miles of track, and to build into La Porte, about four miles. F. H. Peters, Superintendent and Chief Engineer, will have charge of the work.

**Mexican International.**—Active work has begun on the construction of a branch line of this road from Monclovia, Mex., to the rich mining camp of Sierra Mojada, in the State of Coahuila. The new line will pass through a rich agricultural and mineral country.

**Midland Terminal.**—President Collbran has received a cablegram from Auditor W. K. Gillette, from London, giving notification of the sale of the bonds of the Midland Terminal. The work of completing the road from Victor, south to the Cripple Creek Mines will now be pushed as rapidly as possible.

**Minneapolis, St. Paul & Ashland.**—This is the name of a company recently organized at Ashland, Wis., by Judge J. W. Cochran, E. A. Shores, Thomas Bardon, D. W. Mowatt, S. S. Fifield, W. R. Sutherland, Dr. Edwin Ellis, Ashland; John W. Perley, St. Croix Falls, Wis.; R. L. McCormick, of Hayward, Wis.; William R. Bourne, Shell Lake, Wis.; S. G. Cook, C. H. Pratt, P. D. McMillan, Minneapolis, and A. R. McGill, St. Paul. Mr. Platt, the Secretary of the company, states that the object of the projectors is to secure more direct communication between Ashland and St. Paul. In outlining the plans of the company, he says that it is intended to lease a right-of-way on the "Soo" line from the point where it crosses the Belt Line to St. Croix Falls, and will enter the Twin Cities on the Belt Line. It will open up a new country, touching only two railroad points—Shell Lake and Hayward. Between those points its route is from three to 15 miles east of the Omaha road, and for 40 miles passes through a fine hardwood belt tributary to the St. Croix River.

**New Roads.**—George M. Glazier, Boston, Mass; Nelson Green, New York City; T. T. Kechler, Philadelphia, and D. A. Wheelock, of Warren, Pa., are organizing a company to build a railroad from Barcelona, on Lake Erie, by way of Westfield and Mayville, to Jamestown, N. Y., and Warren, Pa., and from the latter place to the coal fields of Pennsylvania.

**Pennsylvania.**—About 100 men, in charge of Civil Engineer Mickey of Wall, are at work on an extension of the West Penn branch from Bolivar to Sang Hollow, Pa., a distance of fifteen miles. One track is being laid and a township road is being made alongside the line.

**Quebec Railroads.**—The Quebec legislature has passed a resolution disposing as follows of the unlapsed railroad subsidies to secure the completion of certain railroads in that province: To the Quebec, Montmorency & Charlevoix, $100,000; Pontiac & Pacific Junction, $110.000; Ottawa & Gatineau Valley, $157,147; Great Northern, $100,000; South Shore, $50,000.

**Roaring Creek & Charleston.**—A number of representatives of New York interests connected with this road, which is in the hands of a Receiver, made a trip over the line last week from the West Virginia Central & Pittsburg road, to Womelsdorf, W. Va., to which the road is completed, with a view to investigating the advisability of continuing the work. The road is graded as far as the mouth of the Cassata Creek, and is ready for the rails a good part of the way. It passes through fine timber and coal lands. It is given out that work will begin again as soon as the legal complications are disposed of.

**Rumford Falls & Rangeley Lakes.**—The construction work on this road in Eastern Maine is nearing completion. Nearly all the rock ledges will be taken out this month. About 350 ft. of the trestle on the Androscoggin bridge is completed. The abutments here will be finished in six weeks. The Swift River trestle above Rumford Falls, 250 ft. long, is completed, as are the abutments. There are about 700 ft. more of the trestle work which will be pushed forward as rapidly as possible. The road is an extension of the Portland & Rumford Falls road, north of Rumford Falls, Me.

**Salt Lake & Hot Springs.**—The directors have finally decided to push the extension of the road north to Farmington, Utah, at once, and President Woodman and General Manager Bamberger have been directed to push the work. Surveys have already been made and negotiations begun for right of way and for terminal facilities in Farmington. The contracts have already been let for the four miles of grading that will be necessary, and a large amount of the building material is already in hand.

**Selmer & Tennessee River Valley.**—On Jan. 19, the city of Selmer, Tenn., voted a subscription of $10,000 to the capital stock of this road. The road will be built from Selmer, on the Mobile & Ohio, to the national cemetery at Pittsburg Landing, on the Tennessee River, passing through the park to be built by the National Government.

**Ste. Emilie.**—This company is applying for power to construct a line of railroad from a point in St. Gabriel de Brandon, Quebec, to St. Michel des Saints, passing through St. Damien, Ste. Emilie, St. Corne, St. Yvon.

**Sugar Creek, Pack's Branch & Paint Creek.**—The stockholders have organized at Fayetteville, W. Va., with the following directors: F. N. Smith, William Prince, F. Prince, E. S. Smith and W. Smith. The officers are F. N. Smith, President; James F. Prince, Vice-President; E. Smith, Secretary and Treasurer, and Enoch Smith, General Manager. The road is to connect the Loup Creek branch of the Chesapeake & Ohio Railroad beginning at the mouth of Sugar Creek, in Fayette County, W. Va., and running up Sugar Creek and down Pack's Branch, to the main line of the Chesapeake & Ohio. It is to develop coal and timber lands owned largely by the stockholders along the line. Grading has been commenced, and the construction is to be pushed vigorously.

**Texarkana & Ft. Smith.**—The contract for extending the road from Little River, Ark., north into Sevier County, was let last week and work will be begun immediately. A Texarkana firm secured the contract.

**Union Pacific, Denver & Gulf.**—The seven miles of the new connection between Trinidad and Forbes Junction, Col., will be completed by February. That will give the company a line 20 miles long north from Trinidad, branches formerly constructed to connect with the Denver & Rio Grande road being utilized. Construction will then be taken up at the northermost termination of these short branches, 20 miles from Trinidad, and will be rushed as rapidly as possible. Receiver Trumbull is now in New York on business connected with this new road.

**Wheeling Bridge & Terminal.**—Work on the Benwood extension of this line, which has been at a standstill for several months, will be resumed within the coming week. The extension is completed from Wheeling, W. Va., to the Riverside Iron Works, at the upper end of Benwood, and the line when finished is to reach the Wheeling Iron & Steel Co.'s works, half a mile below. The road is to follow the Ohio river bank, and the space being narrow at this point, it has been necessary to wait till the cinder tapped from the furnaces of the two concerns mentioned had accumulated sufficiently to form the roadbed. The cinder is hauled to the right of way in a molten state, in ladle carriages, and dumped while hot. This welds to the cinder previously dumped, and forms an excellent roadbed. It is expected the extension will be completed within two months.

## GENERAL RAILROAD NEWS.

**Atchison, Topeka & Santa Fe.**—The Receivers are completing their examination of the property, being now on a trip over the Colorado, New Mexico and California lines of the property. It is announced that on Feb. 21, the tariff department of the general freight office will be transferred to Topeka, Kan., and consolidated with the department there, and that several changes in the traffic departments will probably result from a concentration and re-distribution of the work. The Receivers have been applying their pruning knives pretty freely lately, with the result of an aggregate saving of some $100,000 a year in salaries and office expenses. Two of the unprofitable branch lines, the Wichita & Western and Manhattan, Alma & Burlingame, in Kansas, were last week placed under separate receiverships, the former to be operated by Joseph H. McEntire and the latter by Hiram P. Dillon.

**Baltimore & Ohio.**—The earnings for December, for the last three years, are given in the following table:

| Lines east of the Ohio: | 1894. | 1893. | 1892. |
|---|---|---|---|
| Gross earn | $1,429,242 | $1,428,371 | $1,630,582 |
| Oper. expen | 915,259 | 947 515 | 1,157,697 |
| Net earn | $ 513 983 | $ 480,855 | $ 472,885 |
| Net six months | 3,488,851 | 3,486,520 | 3,361,640 |
| **Lines west of the Ohio:** | **1894.** | **1893.** | **1892.** |
| Gross earn | $438.194 | $434.675 | $569.076 |
| Oper. expen | 361,944 | 342,733 | 469,122 |
| Net earn | $ 76,250 | $ 91,942 | $ 99,954 |
| Net six months | 555,492 | 1,071,773 | 696,190 |

**Boston & Lowell.**—The Massachusetts Railroad Commissioners have approved the issue by the Boston & Lowell Railroad corporation of $500,000 four per cent. bonds, due 20 years from March 1, 1895, for the purpose of paying and refunding 7 per cent. bonds.

**Boston & Aroostook.**—Negotiations for the control by the Boston & Maine of the recently opened Boston & Aroostook Railroad extension have, it is understood, been under way for some time, and steps will be taken shortly to bring the line over to the Maine Central for operation.

**Chicago & Southeastern (Ind.)**—Suits were filed in the Hamilton County Court, Ohio, last week against the railroad company asking for the appointment of a Receiver. The amount involved is only $2,500.

**Cleveland & Wheeling.**—John W. Wardell, as Receiver for the Cleveland, Canton & Southern, has taken cognovit judgment against the above named road, at Steubenville, Ohio, for $109,026. The Cleveland & Wheeling was chartered as the successor of the South Pennsylvania & Ohio road, in 1887, and considerable grading was done in Harrison and Jefferson Counties, Ohio. It is given out that this is a move toward building a connecting link between the Lake Erie, Alliance & Southern, which now terminates at Bergholz, Jefferson County, Ohio, and the Ohio River. The rights of way belonging to the Cleveland & Wheeling are valuable, and the surveyed line will afford a good outlet for the Lake Erie, Alliance & Southern.

**Detroit, Bay City & Alpena.**—Messrs. J. P. Morgan & Co., of New York, announce that they have prepared a plan for the reorganization of the Detroit, Bay City & Alpena Railroad, the property of which was recently purchased at foreclosure sale on behalf of the bondholders. The plan provides for the formation of a new company to be called the Detroit & Mackinac, with a capital stock of $3,000,000 and a bonded indebtedness limited to $4,000,000 in 4 per cent. 100-year gold bonds. Of the latter $1,500,000 are "first lien bonds," and are to be used for extensions to Bay City and Mackinac or the acquisition of existing lines to those places, and for expenses of reorganization. The balance, $2,500,000, are to be "mortgage bonds" subordinate to the above named in lien, and of these $1,250,000 are to be delivered as promptly as possible after the plan shall have become operative to holders of Drexel, Morgan & Co.'s receipts for Detroit, Bay City & Alpena bonds, and $750,000 are to be held for later distribution. This leaves $500,000 for additions and improvements, at the rate of not over $50,000 in any one year. The remaining $750,000 of new bonds, together with $2,000,000 of common stock, are to be held by a committee of three in trust for the holders of certificates of beneficial interest, which will be issued to holders of the present receipts. The committee is authorized at any time to fund the interest on these bonds into preferred stock, of which the issue is limited to $1,000,000, or to exchange them into preferred stock. The time for the distribution of these bonds and of the $2,000,000 of common stock among the holders of the present reorganization receipts is left optional with the committee. In their letter accompanying the plan Messrs. J. P. Morgan & Co. say: "Considering the present small earnings of the property it is not deemed safe now to distribute over $1,250,000 of these bonds, and the plan therefore proposes to retain the other $750,000, as well as the stock in the hands of the committee until it can see its way to distribute the same, and it is also thought best to give the committee large discretion, including (as already stated) power to convert the $750,000 bonds into preferred stock, if it shall think such a course expedient for the protection of the holders of the outstanding $1,250,000 bonds."

**Illinois Central.**—The company reports earnings for recent periods as follows:

| November. | 1894. | 1893. | Inc. or dec. |
|---|---|---|---|
| Gross earn | $1,842.031 | $1,872,068 | D $30.037 |
| Oper. expen | 1,231,462 | 1,313,305 | D 81,843 |
| Net earn | $610,569 | $558,763 | I $51,806 |
| For five months: | | | |
| Gross earn | $8.076,520 | $10,409,820 | D $2,333,300 |
| Oper. expen | 5,845,505 | 6,695,213 | D 849,708 |
| Net earn | $2,231,015 | $3,714,607 | D $1,483,592 |

**Baltimore & Ohio.**—The statement of earnings for December makes the following comparisons:

| December. | 1894. | 1893. | Inc. or dec. |
|---|---|---|---|
| Gross earn | $1,867,500 | $1,863,000 | I $4,500 |
| Oper. expen | 1,277,500 | 1,290,500 | D 22,900 |
| Net earn | $590,000 | $572,500 | I $17,500 |
| For five months: | | | |
| Gross earn | $12,018,422 | $12,820,405 | D $801,983 |
| Oper. expen | 7,994,865 | $8,262,409 | D $267,544 |
| Net earn | $3,023,557 | $4,557,996 | D 534,439 |

**Lake Erie & Western.**—A special meeting of the stockholders of the company has been called for Feb. 5, at Peoria, Ill., to act upon the proposed acquisition of the Indianapolis, Decatur & Springfield road, and to authorize the extension of the first and second mortgages of the company over that road should it be required.

**New York, Ontario & Western.**—The Company publishes the following report for December:

| | 1894. | 1893. | 1892. |
|---|---|---|---|
| Gross earnings | $263,300 | $268.920 | $280,717 |
| Oper. expenses | 204,000 | 210,638 | 224,010 |
| Net earnings | $59,300 | $58,282 | $56,707 |
| Prop. expense to gross | 77⅛ | 77¾ | 79¾ |
| For the twelve months: | | | |
| Gross earnings | $3,737,580 | $3,901,140 | $3,473,760 |
| Oper. expenses | 2,652,244 | 2,887,924 | 2,605,693 |
| Net earnings | $1,085,336 | $1,013,216 | $868,067 |

**Oregon Railway & Navigation Co.**—The committee representing holders of the collateral trust bonds of the company, of which John Crosby Brown is the chairman, announces that there has been deposited with the United States Trust Co., New York, more than $3,940,000 of the bonds out of $5,182,000 outstanding, and the time within which deposits may be made without penalty has been extended to Feb. 1.

**Philadelphia & Reading.**—A protective committee to represent the holders of the junior securities of the railroad company has been organized, consisting of R. M. Gallaway, of New York, chairman; Issac N. Seligman, David G. Legget, of Whitehouse & Co.; Simon Wormser, and Emanuel Lehman. The committee points out that the Olcott-Earle plan of reorganization is proceeding, with a view of foreclosure under the general mortgage bonds, and in consequence the position of the junior securities is endangered. The holders of the income bonds and shares will be asked to deposit their respective securities with the Farmers' Loan & Trust Co. The individual members of the committee and their respective firms have deposited upward of $4,000,000 of the securities which they own and control.

**Philadelphia, Reading & New England.**—The first mortgage bondholders of this railroad company (Poughkeepsie Bridge system) have appointed the following committee: John S. Wilson, chairman; John Sailer, W. B. Scott, R. J. C. Walker and H. W. Bartol. The committee will confer with other committees and will call a general meeting of the bondholders within two weeks, when some definite plan of procedure will doubtless be determined upon.

**Roaring Creek & Charleston.**—Judge Jackson, of the United States Court, issued an order at Parkersburg, W. Va., last week, referring litigation affecting this railroad, brought before him some time previously, to a special master for investigation and report. The road is being built for about 20 miles through West Virginia, and is completed for 15 miles. A Receiver, appointed by the State courts of West Virginia, is now in charge of the property. Some time after this appointment, proceedings were brought by other creditors in the United States Court, for the appointment of a Receiver by that Court, and that is now referred to as matter for report.

**San Antonio & Gulf Shore.**—The new officers of the railroad, whose names were given last week, have filed a mandamus suit against the former officers to compel the latter to deliver the bonds, stocks, and other assets of the road, as well as to enjoin the latter from interfering in any way with the former in the operation and management of the road. The road has been building over a year out of San Antonio, Tex., and about 40 miles has been graded and the track laid for 25 miles.

**Sioux City & Northern.**—In the case of the Manhattan Trust Co. against the Sioux City & Northern, to foreclose a mortgage, Judge Shiras filed an opinion at Dubuque, Ia., on Jan. 15, sustaining J. Kennedy Tod & Co.'s right to $1,060,000 of Sioux City & Northern stock and $2,340,000 of Sioux City, O'Neill & Western bonds. These securities were deposited with the firm by A. S. Garretson, as collateral security for a loan of $1,500,000 to the Pacific Short Line Bridge Co. The Union Loan Trust Co., whose assets the Credits Commutation Co., of Sioux City, has acquired, claimed these collaterals under a previous pledge, which it failed to prove on trial. The case will be appealed.

**Union Pacific.**—United States Circuit Judge W. F. Sanborn, sitting at St. Louis, has given an opinion in the application of Winslow S. Pierce, of New York, for a foreclosure of the first mortgage on the Union Pacific properties embraced in the main line, from Omaha to Ogden, appointing the present receivers. The application asked for a separate receivership and other concessions in the interest of the first mortgage bondholders, and was opposed by the representatives of the Union Pacific receivers. Judge Sanborn issued an order appointing the same receivers, pending the settlement of the foreclosure proceedings. William D. Cornish, of St. Paul, is appointed special master. The order issued by the Court is the first step to foreclosure and to secure the sale of the main line. Under the Court's instructions the receivers are liable so far as the main line is concerned to the first mortgage bondholders exclusively. The next step will be a suit filed by Winslow Pierce for the bondholders in Omaha.

**Western New York & Pennsylvania.**—In the annual report just published, the Directors state that since the issuing of the last annual report, on June 30, 1894, there has been a gradual improvement in the company's business. For the five months, July to November, 1894, there has been a gain in the traffic moved as compared with the same period in 1893 of 321,505 tons, or over 19 per cent. The increase in gross earnings for five months is $87.300 and in net earnings $172,360. The increase in tonnage has been largest in bituminous coal, but we have also had a gratifying increase in general merchandise and mineral tonnage. Anthracite coal tonnage during the above period was not so large as in 1893, because of lighter sales in the West and Northwest. "The average rates per ton per mile at which traffic has been moved during the five months have been unsatisfactory and much lower than for the same period in 1893. This has been caused mainly by the extremely low rates on soft coal."

**Zanesville Belt Line.**—Under an order of the United States Court, the property of the Zanesville Belt Line Railway Co. was sold last week. The sale was made under foreclosure proceedings brought by the Mercantile Trust Co., of New York, which holds a mortgage for $225,000. When the suit was entered, the Painesville, Worcester & Ohio, and the Zanesville, Mount Vernon & Marion Railroad Companies each claimed the right of way. The latter was decreed to be the owner of the property. It was sold to C. G. Kidder and H. Powers Farr, of New York, and Charles E. Andrews, of Zanesville, a committee representing the bondholders, for $50,000.

## TRAFFIC.

### Traffic Notes.

The Queen & Crescent has put on dining cars between Chattanooga and Cincinnati. New cars have been built for the service. Meals are served by the card at moderate prices.

The Wheeling & Lake Erie, and its connections, have put on a fast through night freight train between Wheeling and Cleveland, O., which makes the trip between these cities in about nine hours.

The Post Office Department at Washington finds that lottery circulars and other mail matter are being carried by express companies in packages other than stamped envelopes, and a circular will be issued calling attention to the law.

The Railroad Commissioners of Texas have temporarily suspended the operation of the tariff on coal which they ordered in effect Dec. 28. This is the second suspension of this tariff for the purpose of hearing further arguments for changes. The tariffs on paper, stock, brick and other commodities are still under discussion.

The Railroad Commission of Missouri has ordered that the line of the Atchison, Topeka & Santa Fe, from Richmond to Richmond Junction, the St. Joseph & Belmont branch of the St. Louis, Iron Mountain & Southern, the Kansas City, Clinton & Springfield, and the Columbia branch of the Wabash, hereafter charge three cents a mile for passengers instead of four, as heretofore.

W. F. Ladd & Co., of Galveston, have filed a suit in the County Court at Austin, Tex., asking an injunction against the State Railroad Commissioners, restraining them from enforcing their cotton tariff, which prescribes rates to Galveston in every case 6 cents per 100 lbs. higher than to Houston. It will be remembered that the merchants of Galveston made strenuous opposition to this tariff before the Commission a few weeks ago.

### Chicago Traffic Matters.

CHICAGO, Jan. 23, 1895.

Practically every road eastward from Chicago is now quoting 20 cents per 100 lbs. or less on grain to New York, and the situation is even worse at the lower Mississippi River crossings. There is considerable opposition to making an open rate of 20 cents on account of its effect upon interior traffic, and were it not that the taking of individual action by the lines is making havoc with the eastbound agreement for a division of this business, the strong lines would be content to let the matter drift. The trouble with the agreement is that, like its numerous predecessors, there is no penalty attached to the violation. Any road running behind is supposed to report to the Commissioner, who has authority to order that road to reduce its rates for a limited time to enable it to catch up. Instead of doing this, everybody has been "evening up" for himself, with the result that the whole scheme is now in a chaotic condition.

The formation of a new transcontinental passenger association now apparently depends upon the outcome of the pending conference with the Union Pacific in respect to the Ogden gateway. Some of the lines are advocating going ahead without the Union Pacific rather than overturn the work that has already been accomplished in other directions.

The Southern Pacific having finally receded from its demand for lower freight rates from New York to the Pacific coast via its Sunset route than were to be made from Chicago and Mississippi river points, a compromise agreement has been reached by the terms of which all Pacific coast rates are to be advanced from the present basis of 30 cents per 100 to 50 cents per 100, New York and Chicago to all Pacific coast points except Portland, which is to take a rate of 55 cents, effective Feb. 4. This is a decided victory for the Atchison and its supporters among the Chicago lines, who have all along stood firm in the position that New York should not take a lower rate than Chicago on this business.

Another attempt was made last week to secure an advance in live stock rates to Chicago sufficient to overcome the $2 switching charge imposed at the Union Stock Yards, but several of the roads stated that it was impossible to advance rates at present as it would raise local rates beyond the point allowed by the laws of some of the States in which they operated. Nothing can be done, apparently, except for the roads to carry the matter up and endeavor to get the decision of Judge Grosscup reversed. This will probably be done as soon as possible. A suit is now pending against the Alton which will afford the opportunity in case nothing is done by the Atchison.

Passenger representatives of the Chicago–St. Paul lines have made another agreement doing away with excessive commissions on eastbound business.

It looks as though the agreement of the eastbound lines not to pay commissions was working pretty well, judging from the fact that the scalpers are resorting to their old tricks of raising tickets by plugging, thus indicating that their supply of new material was getting scarce.

General Passenger Agent Heafford, of the Chicago, Milwaukee & St. Paul, has served notice on the other Chicago lines that he has conclusive evidence that some of them have been violating the provisional agreement formed at the death of the Western Passenger Association Dec. 1, especially in the matter of rates to theatrical people, and hereafter the St. Paul road will show this class of travel fully as much consideration as has recently been accorded to it by the St. Paul's "none the less energetic, but more unscrupulous competitors."

The Atchison will again commence, Jan. 26, prorating on grain from Illinois points on its lines east of Princeville and Pekin, including the latter, to territory in the Central Traffic Association and to the western termini of the trunk lines and points East, based on the percentages of the regular tariffs now in effect, except that on freight originating at 110 per cent. points the rates will be made 1 cent higher than the established basis, the additional cent going to the Atchison in division.